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USSR Report

TRANSPORTATION

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CIVIL AVIATION

MINISTRY WANTS BETTER COMMO FACILITIES FOR AGROAVIATION

Moscow VOZDUSHNYY TRANSPORT in Russian 25 Aug 84 p 2

[Report: "In the MGA [Ministry of Civil Aviation] Collegium"]

[Text] The problem of improving radio communications support for aircraft operations in the national economy was examined at a regular meeting of the MGA Collegium. It was noted that definite work in this direction has been carried out in civil aviation administrations; since the beginning of the 11th Five-Year Plan, a significant number of radio communications projects have been organized in the sector.

At the same time, there are substantial shortcomings in providing flights with radio communications support. Proper steps are not being taken in administrations and enterprises to extend the network of support bases for the PANKh [use of aircraft in the national economy] regions. Radio equipment and communications facilities at a number of airports for local air routes and points for PANKh flight support are at locations that have been adapted; construction of new facilities, especially in the country's northern and northeastern regions, is not being provided for. There is no noticeable improvement in electric power supply for radio communications projects.

Managers of a number of aviation enterprises in the Far East, Magadan, Yakutsk, North Caucasus, Turkmen, Tyumen, Ukrainian and Estonian administrations concern themselves little with the problems of providing crews at operations points with communication and support bases. Staffing of PANKh support points with communications specialists remains low, and there are cases of equipment breakdowns in regions where aircraft are used in the national economy because of poor-quality and ill-timed routine maintenance and inferior training of technical personnel.

The MGA Collegium approved a decree making it incumbent upon managers of both territorial administrations and those in the ministry's central organization to take the necessary steps to further improve radio communications support for aircraft operations in the national economy; to include special divisions for this problem and for development and equipment of support bases in comprehensive plans to develop civil aviation administrations in the 12th Five-Year Plan; to provide for the organization of fixed radio communications facilities

in regions of PANKh operations and to put equipment in operation in the periods of time stipulated by plans; and to work out a comprehensive program for introducing the achievements of scientific and technical progress to further improve radio communications support for aircraft operations in the national economy for the 12th and 13th five-year plans and up to the year 2000.

The MGA Collegium also examined the problem of stocks of uninstalled equipment and measures to return it for economic turnover. It noted that stocks of uninstalled equipment at aviation enterprises are being increased, in spite of work conducted to implement appropriate directive and guidance documents.

The largest amount of uninstalled equipment, primarily costly radio and electrical engineering and lighting equipment, involves the departments of capital construction, the ERTOS [Main Administration for Operation of Radio Technical Equipment and Communications in Civil Aviation] bases, departments for operating ground installations, air maintenance bases, the GSM [fuel and lubricants] service, and civil aviation plants. Thus, radars and an outlying radio receiving center [vynesenny priyemnyy radiotsentr] have not been put into operation at the Bukhara airport since 1980, the secondary radar at Tashkent has not been put into operation since 1982, and the "Svecha-3" installation has not been put into operation at the Odessa airport since 1981.

Equipment requisitioned from OMTS [material and technical supply department] warehouses is not taken out for an extended period of time. Plan schedules for introducing uninstalled equipment in the Far East, Krasnoyarsk, Komi and other administrations have not been confirmed, and their implementation has not been provided for by specific organizational and technical measures.

A spot check has established that violations of the TsSU SSSR [USSR Central Statistical Administration] and Ministry of Civil Aviation requirements for an inventory of uninstalled equipment are not being eliminated in the East Siberian, Krasnoyarsk, Leningrad, Tajik, Turkmen, and a number of other administrations. There is evidence that such an inventory of uninstalled equipment is being concealed in the Krasnoyarsk, Leningrad, East Siberian, Tajik and Turkmen administrations of civil aviation.

The MGA Collegium has approved a decree providing for strict and urgent measures to put uninstalled equipment into operation, to efficiently draw stocks of it into economic turnover, and to make the persons guilty of unconscientious inventory of the remainders of materials and equipment disciplinarily and materially answerable.

8936
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CIVIL AVIATION

EDITORIAL URGES IMPROVED AVIATION REPAIR WORK QUALITY

Moscow VOZDUSHNYY TRANSPORT in Russian 25 Aug 84 p 1

[Editorial: "The Quality of Aviation Equipment Repair"]

[Text] Civil Aviation plants each year repair thousands of airplanes, helicopters, aviation engines and tens of thousands of assemblies. The importance of this work is difficult to overestimate. The better the quality of the repair performed, the longer and more reliably will the aviation equipment serve.

"The prestige of test work and the prestige of good-quality work that is said to last two centuries must be raised," CPSU Central Committee General Secretary K. U. Chernenko emphasized in his speech at a meeting with workers of Moscow's Serp i molot metallurgical plant.

The multithousand member collective of aviation repair enterprises is voluntarily toiling on fulfillment of the tasks assigned it. The plan for the first 6 months of 1984 was fulfilled with good economic and financial indicators. In amount of realized output by 103 percent, in commodity output volume by 101.8 percent. Labor productivity exceeded the plan task by 3.2 percent and the reduction in prime production costs exceeded it by 3.7 percent. Almost 90 percent of the growth in output volume came from raising labor productivity.

Earnest attention was paid to output quality. Modernized equipment is being introduced. Technological processes and the organization of production and of the workplace are being improved. The effectiveness of the work of OTK [quality control section] staffs is being raised. The plan for additional measures for raising aviation repair quality has been worked out and is being realized. Questions of quality are constantly being discussed both at plant meetings and the council of directors of civil aviation plants.

However, in the matter of insuring quality of aviation repair, there are still serious deficiencies and omissions. A number of substantiated complaints were made against plants Nos 403, 411, 421 and 21. As checks made at the civil aviation plants have indicated, the main causes of these deficiencies were violations of the technology, poor technical training of operators, poor production rhythm, and lack of responsive monitoring on the part of OTK's. And not everywhere has discipline been well established. And where its level has fallen and where slackness and irresponsibility are manifested, the resulting

defects lead to serious material and psychological harm. At times, organizational and technical measures called for by the plans have not been fully implemented, and this is an indicator of inadequate executive discipline. The reproach here should be directed toward not only the management of the enterprises where such instances occur but also toward the management of the All-Union Association Aviaremont, which still does not always pay ongoing attention to preventive measures for avoiding defects, does not efficiently monitor the realization of measures that have been developed, and does not fully display exactingness toward those who do not insure high output quality.

In order to raise repair quality, it is necessary above all, at all times, to increase the responsibility of each operator for the job he is charged with, to strengthen the state of organization and order at each workplace, to establish conditions that will preclude grounds for the appearance of defects in the work. It is precisely this that is the key to successful solution of the problems.

The Comprehensive System for Controlling Repair Quality of Aviation Equipment [KSUKRAT], which was developed in accordance with USSR Gosstandart [State Committee for Standards] recommendations, should promote all-around fulfillment of this task. The creation of those production circumstances and mutual relationships that will insure high-quality work by all aviation-repair enterprise workers--from the ordinary operator to the supervisor at any level--is included in the system's mission. The introduction of this system into the production life of repair enterprises will bring tangible benefit. However, the functions that it calls for are not always active, and its requirements are not being met at times. This occurs because some supervisors upon whom the effectiveness of aviation-repair quality control depends incorrectly consider that creation of the system in and of itself solves management's problems. As a result, this system does not always cover all spheres of the collective's activity that influence the quality of aviation-equipment repair.

The basis of effective and good-quality work is high production sophistication. It is unthinkable that it does not rely upon a further increase in the reequipping of production with equipment, modern work organization, the judicious assignment of people, precision in the supplying of materials and equipment, and improvement of incentives. As shown by the checks and surprise inspections that the newspaper's editorial board has conducted, together with activist designer personnel, throughout the branch's aviation repair plants under the slogan, "From the effect of repair--to the effectiveness of the branch," there are still many slips. Production sophistication is low at plants Nos 24, 67, 401 and 403. Let us say that at Novosibirsk Plant No 401 the participants of a surprise inspection saw at the production premises dirt and dust where instrument parts are stored in bulk. Indeed, the fight for production sophistication begins with the imposition of elementary order at each workplace.

The laboring collectives are called upon to play an important role in the drive for high quality work. The creation of favorable conditions and an environment that will provide for success of the matter depends upon their efforts and the state of organization. In the laboring collectives' march for high quality, all the diverse modes demonstrated in practice--competitive

social inspections, surprise inspections by People's Control and the Komsomol's Searchlight, quality days, and so on--should be used in the laboring collectives' drive for high quality. And, finally, questions of quality should be the subject of interested discussion at workers' meetings.

In the struggle for high quality of aviation equipment repair, it is difficult to overestimate the role of socialist competition, which opens up the widest expanse for initiative, creativity, the search for reserves and a borrowing and introduction of all that is new and advanced. This is also a wide field of activity for the All-Union Association Aviaremont and for plant management, trade unions and other social organs.

11409
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CIVIL AVIATION

STUDY OF EFFECTS OF LIGHTNING ON AIRCRAFT SYSTEMS STRESSED

Moscow VOZDUSHNYY TRANSPORT in Russian 25 Aug 84 p 3

[Article by Yu. Kobzarev, academician and Hero of Socialist Labor, and M. Aleksandrov, professor (Moscow): "Against Lightning"]

[Text] The report, "Where Lightning Strikes" (VOZDUSHNYY TRANSPORT, 31 March 1984) told about the wide and undoubtedly urgent problem of protecting aircraft against dangerous electrical influences of the atmosphere. This important topic is further developed and explored in this article, which the editorial board obtained from the Institute of Radio Engineering and Electronics of AN SSSR [USSR Academy of Sciences].

One cannot help but concur with the overall approach to solving the problem that was set forth by Candidate of Engineering Sciences O. Trunov, chief of a GosNII GA [State Scientific-Research Institute for Civil Aviation] section. The complex nature of the problem and the necessity for solving it in three mutually related directions--"the environment, its effects, and the protection of aircraft from harmful effects"--were correctly emphasized. The article briefly recalled the necessity for creating new means and methods for detecting electrically active areas of the atmosphere.

In this connection, we would like to dwell on this promising area. If it is developed successfully, it will be possible to obtain an integrated solution to the problem of detecting (and forecasting) dangerous meteorological phenomena, which, in the final analysis, will increase the safety, regularity and economy of aerial hauling.

A collective of specialists of the Institute of Radio Engineering and Electronics of the AN SSSR is now conducting, in close collaboration with GosNII GA specialists, appropriate research in the area of atmospheric electricity and ice formation. In our opinion, this work deserves every support and development.

Each day our knowledge of the laws of nature expands. One of the interesting areas of research is the process of the generation and propagation of radiowaves. Life today without radio is unthinkable. This includes communications, television, radar and many other things.

It should be noted that the use of radiowave radiation for various purposes is usually inhibited by other types of radiowave radiation and radiowave interference. For example, airplane crews know quite well that radiocommunication is disturbed when flying close to thunderstorm cells, when crackling, clicks and noise appear in the earphones to the point of almost total cessation of communications. The sources of this interference are discharges of atmospheric electricity, which generate radiowave radiation over a wide frequency spectrum.

However, the interference from lightning discharges can be used for practical purposes. If one learns to determine the distance and direction to the source of the radiowave radiation--the lightning--this will enable the position of the dangerous thunderstorm cells to be found.

As is known, weather radar (MRL) now serves this purpose. However, its operating principle is based upon recording radiowave radiation reflected from drops of water in the clouds, which are only indirectly connected with the atmosphere's electrical activity, while recording the radiowave radiation of the lightning itself is a direct method of measurement.

The principle of thunderstorm direction-finding became known comparatively recently. But the apparatus that has been used is cumbersome and not reliable and precise enough. Only the direction to the thunderstorm was determined, not the distance to it.

This is related to the task of determining the moisture content of clouds and the weather hazard they pose, and also to defining areas of atmospheric disturbance.

However, the task of timely detection of meteorological phenomena unfavorable for aviation is the first stage of the research.

A more complicated but necessary step in further work consists in determining the degree of danger of the external effects that an aircraft can encounter. In considering the requirements for regularity of flights and, especially, the saving of fuel, technical equipment must be built that will prevent aircraft from getting into atmospheric areas where serious negative consequences are possible. Under standardized conditions, an airplane should be reliably protected and capable of operating without restrictions.

Putting all these methods into practice previously was prevented by the need for complicated mathematical processing of the received radiowave signals by complicated and bulky computers.

Now, microelectronics have been developed that will enable the solution of an immense number of tasks heretofore unresolvable, computer complexes having become increasingly compact and lighter from day to day. Because of this, it has now become possible to realize the above-described methods for defining areas of dangerous meteorological phenomena in order to provide for the safe flight of civil-aviation aircraft.

The solution of this required the involvement of substantial scientific forces of many institutes and organizations. The work began on the basis of scientific and technical collaboration between the AN SSSR Institute of Radio Engineering and Electronics and GosNII GA. The scope of the tasks and methods for solving them was determined, and algorithms for processing the received signals and designs for the sensors were worked out. The thunderstorm is located by a special laboratory that GosNII GA equipped, and inflight experiments were prepared for developing the airborne equipment.

It is desirable to create a single set of airborne equipment, which would consist of several sensors, a computer complex linked with the onboard radar, and one colored indicator for information output to the crew about all dangerous weather phenomena along the aircraft's route. Such an airborne complex, to be created on the basis of modern microelectronics, will be light and compact enough to permit an increase in the flight safety of aircraft in areas of dangerous meteorological phenomena. However, it should be emphasized once more that successful solution of this most complicated task is possible only with an integrated approach, with the joining of forces of specialists of various fields.

The USSR Academy of Sciences attributes great importance to the solution of this problem.

In this connection, it would be desirable to expand the front of these operations in the organizations concerned.

11409
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NEW AIRPORT GROUND TRAFFIC CONTROL SYSTEM PLANNED

Moscow VOZDUSHNYY TRANSPORT in Russian 5 Jul 84 p 3

[Interview with Al'bert Konstantinovich Donskoy, chief of the Department of Lighting Systems for Landing of the Scientific Testing Center for Air Traffic Control Automation, by correspondent G. Grishayeva: "The Illumination of New Lights"]

> [Text] Each step on the path of improving flight regularity under instrument weather conditions requires further improvement not only of aircraft on-board systems, but of ground-based systems as well. One such complex problem which must be resolved in order to conduct flights under ICAO [International Civil Aviation Organization] Category III weather minimums is the establishment of a system for controlling and monitoring the ground movements of aircraft and special vehicles about the airport.
>
> A. Donskoy, V. Krylov, Yu. Fedotov, L. Shcherbakov and others, staff members of the Scientific Testing Center for Air Traffic Control Automation, are working on the problem of creating such a system. Our correspondent has a discussion with A. Donskoy, chief of the Department of Lighting Systems for Landing.

[Question] "Al'bert Konstantinovich, what is the system for controlling and monitoring ground traffic?"

[Answer] "First of all, it must be stated that all airports need one type of system or another to control and monitor ground traffic. At the same time, they may be simple at small airports and complex at large ones where flights are conducted under poor visibility conditions."

The use of systems consisting of lighting equipment, including taxiway side lights and lighting indicators for different purposes, as well as radio communication facilities and the utililization of specific ground traffic control rules, has been completely adequate until now. Flights under ICAO Category III weather conditions, in which the visibility range of signal lights is 50 to 200 meters, require the employment of new and technically more improved lighting and radar facilities.

In addition, rules and instructions need to be developed for flight and controller personnel to use the systems, which is a complex task requiring unity of efforts by specialists in the fields of lighting technology, radar, radio communication, remote control and, of course, air traffic control.

[Question] "You spoke of new technical facilities to be used in the system. Tell us about them in more detail."

[Answer] "The use of radar to scan the airport field, which will provide the ground controller with information on the location of all aircraft under his control, is new and specific."

Under these conditions pilots need especially reliable visual information on the taxiing route. For this the taxiways will be equipped with recessed green lights situated in the centerline at 15-meter intervals in straight sections and at intervals of 7.5 meters on curves. These lights enable the pilot to follow the taxiway centerline even under the worst visibility conditions. Recessed red stoplights also will be used, along with the green centerline lights. They are spaced 3 meters apart in a row across the taxiway where it is necessary to give a stop signal to the pilot of a taxiing aircraft.

Recessed lights make it possible to produce a beam of light readily visible to pilots. They are installed in a specially bored cylindrical opening in the taxiway concrete so that only a small part of the light emission appears on the surface.

[Question] "Let us mentally picture the work place of the ground controller in the airport control tower. How will it be changed with the appearance of new technical facilities in the control and monitoring system?"

[Answer] "First of all by the presence of a radar scope to scan the field. The 'Obzor-2' of domestic manufacture will become the 'eyes' of the controller under instrument visibility conditions. The controller will be able to see both the runway and the taxiways on its screen, as well as the aircraft and special vehicles on them. A graphic panel of the taxiway lighting arrangement, which will reproduce in miniature a true picture of the signal lighting on a diagram of the airport, will be situated next to the radar scope. In case of any malfunction it instantaneously warns the controller about it and indicates the location and nature of it."

[Question] "In addition to the technical facilities, what will be new in the system?"

[Answer] "Another most important part of the task of building the system, apart from selection of the technical facilities for control and monitoring, is development of the overall concept of its construction and use."

The objective of working out such a concept is to achieve maximum safety for ground traffic under different weather conditions, including instrument weather, while maintaining the required level of traffic density, reducing the controller workload, and providing the best, most economical taxiing patterns.

All this is achieved by introducing and adhering to standard taxiing routes. These are routes especially developed for each specific airport in which aircraft taxiing in the opposite direction and intersecting traffic are excluded. The controller will be able to turn on the entire series of signal lights which designate this route by pressing a button on the control panel. Telemechanical equipment for remote control will make it possible to achieve such a level of efficiency.

[Question] "What are the prospects for putting the ground traffic control and monitoring system which is being developed into use in civil aviation?"

[Answer] "At present, such a system is being planned first of all to equip Sheremet'yevo Airport, which is being readied for flights under ICAO Category III weather minimums. Other large airports in our country will be equipped with such systems in the future."

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CIVIL AVIATION

'START-2' ATC SYSTEM INSTALLATION PROGRESSES AT LENINGRAD

Moscow PRAVDA in Russian 6 Jul 84 p 6

[Report by correspondent V. Senin: "A Computer Among the Assistants"]

[Text] Leningrad--The "Start-2" automated air traffic control system is being installed at Pulkovo Airport.

The Leningrad Administration serves passenger routes which link over 170 cities in the country. And not one aircraft operates on its own after taking off, but is linked with air traffic control centers and has a closely controlled route. Over the past 10 years new airport complexes have been built in Vologda and Murmansk, but the largest airport is Pulkovo.

The technical re-equipment of Pulkovo Airport is continuing: a third runway has been put into operation, and an experimental automated system for refueling aircraft is being built. The air traffic control service also is being filled with electronic technology. The widely known "Start" system now has fully proven itself. It controls the movements of 36 airliners simultaneously. But this is not much today: in the summer flight period, Pulkovo handles up to 200 arriving aircraft. And the same number of departing aircraft. It is difficult for the air traffic control service: so many arriving and departing aircraft must be accommodated, they must be separated by air corridors and directed to follow a closely controlled course. "Start-2" will soon take on this work.

"The responsibility for safety in the air lies with the controllers," says Yu. Murkin, flight operations manager at Pulkovo Airport. "The sky, as is well known, does not forgive errors. It is also our job to ensure that passengers travel without uneasiness and apprehensions."

Each flight is unique, even on the same route. It is not hard to imagine the kind of stressful workload endured by the controller if it is taken into consideration that during a heavy traffic period one of them follows 10 to 12 aircraft in his area. In making corrections in their movement, he has to know exactly the assigned altitude, airspeed and course for each one, to see deviations and make a correction promptly, to take weather conditions into account, and to bring the airliner to a landing with accuracy to the minute.

"It was difficult before the 'Start' system was introduced," controller V. Kapayev says. "Try retaining such a volume of data in your memory. Communication by radio is maintained with the aircrew. Sometimes an instantaneous decision must be made in order to separate aircraft on conflicting courses. The automated air traffic control system has taken on these functions, and by giving a person elbowroom to operate, it has lightened his workload significantly."

"Start" is the first domestic system. It began operation at Pulkovo. They tested it here and made refinements. It is difficult to conceive of air traffic control service activity without it today. It is quiet in the control center. The controllers on duty are at panels for each area. One is controlling takeoffs, and another the so-called pattern area. There are controllers for taxiing and landing traffic. Routine data have arrived from a controller at the area control center. The controller enters the data in a log and passes the information on the spot to the EVM [computer]. A controller immediately sees both a moving aircraft and exhaustive data on it on the radar screen: the side number, the flight corridor, course, altitude, airspeed... When necessary, the automatic controller inquires and indicates on the display board the fuel remaining in hours and minutes of flight time.

On an aircraft's approach to the airport, a controller specifies the altitude and landing runway and hands off control of the aircraft to the pattern controller. And an aircraft on the runway is cleared for takeoff, climbs out and departs on course.

"Start-2" is replacing the present system. It will enable the air traffic control service to control traffic in the area of two or three airports and will begin controlling the movements of up to 100 aircraft at once. A special building has been built for the new system. The control room is spacious and well-lighted, with positions provided with the latest word in equipment connected with the computer. "Start-2" will provide the collection, processing and representation of full data on aircraft--from their takeoff to departure from the air traffic control area. The system also will be able to photograph and record on tape the movement of aircraft in the approach and landing zones. "Start-2," which has a large memory, will enable the controller to determine the situation planned at any time with a recording on the display, to compare it with the circumstances which have developed, and when necessary, to determine the circumstances for some time in advance and expeditiously change one type of aircraft for another to avoid underloading and unnecessary fuel consumption.

Installation of the equipment is nearing completion. Next year tests of the new complex will begin so that it can begin operation in the next five-year plan. When the "Start-2" system is in operation, Pulkovo Airport will not only ensure complete safety and comfort during heavy air traffic, but will be able to accommodate aircraft in practically any weather.

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CSO: 1829/362

Il-86 FUEL CONSUMPTION, ROUTE PROLIFERATION NOTED

Moscow VOZDUSHNYY TRANSPORT in Russian 4 Aug 84 p 3

[Report by correspondent V. Degtev: "Every Flight Is a Standard One"]

[Excerpts] Sheremet'yevo--The aviation subunit for Il-86 aircraft has not been in existence for a long time. But it can already be said that it has passed its test of maturity. Specific results attest to this. Over the past 3 years, the geographic areas linked by Il-86 flights have become more widespread, the number of flights has been increased, and the quality of passenger service has been improved. Over a relatively short period of time, the aircraft has visited 43 airports in 33 countries of Western Europe, Africa, Southeast Asia, and the Near and Middle East. During the summer last year, a technical flight was made on the longest route, linking Moscow with Havana. The Il-86 is now making scheduled flights on nine international routes--to Berlin, Sofia, Prague, Paris, Madrid, Frankfurt, Delhi, Hanoi and Ho Chi Minh City.

At this time, more than 770,000 passengers and over 6,000 tons of mail and freight have been carried on Il-86 aircraft.

While during the initial period, for example, not every crew succeeded in avoiding overconsumption of aviation fuel, overall savings in aviation fuel in 1983 added up to a very substantial figure. Introduction of a combination of new energy-saving technologies on international flights has helped to achieve aviation fuel economy. A large group of aviation employees were awarded the USSR Council of Ministers prize for its development and introduction. N. Samsonov, an Il-86 commander, was among the prize recipients.

...The first day of the fourth year since the Il-86 was put into service on international air routes was marked by a new labor contribution to fulfillment of the summer air transport program. The Il-86 made the first scheduled flight with passengers over the transatlantic "friendship bridge" from Moscow to Havana on 4 July.

And quite recently, on 23 July, an Il-86 crew led by Senior Instructor-Pilot V. Strelkovskiy flew the Moscow-Vienna-Tripoli-Lagos route for the first time. This successful flight to the Nigerian capital reconfirmed the advantages of the Il-86, particularly its capability of operating under conditions on the African continent.

8936
CSO: 1829/401

TRAINER-SIMULATOR PROBLEMS; AVIATION REPAIR WORK CONCERNS

Moscow VOZDUSHNYY TRANSPORT in Russian 11 Aug 84 p 2

[Report: "In the MGA [Ministry of Civil Aviation] Collegium"]

[Excerpt] The problem of the status of the development and operation of aviation and controller simulators, aimed at more improved training of specialists and increased flight safety and efficient airspace utilization, was examined at a scheduled meeting. It was noted that dozens of simulators were put into use in the 1981-1983 period, which has made it possible to improve controllers' simulator training to ensure high quality of flight operations and UVD [air traffic control] under conditions attending the introduction of stricter standards for altitude separation. At the same time, a number of shortcomings exist in organization of the introduction and use of simulators. The Aviaremont [Aviation Equipment Repair State Industrial Association] is not providing for output of simulators in the necessary quantity, and documentation has not been developed for all of them.

The GUERAT MGA [Operations and Repair of Aviation Technical Equipment Main Administration of the Ministry of Civil Aviation] is not exercising the proper supervision over technical maintenance and completion of work on aviation simulators to ensure that they are brought into conformity with aircraft. The necessary procedure and high level of responsibility for the technical operation and repair of controller simulators have not been defined, and there is no effective supervision over construction of facilities for the simulators. The deadlines for their construction and renovation are being violated in the Turkmen, Krasnoyarsk and Yakutsk administrations. In a number of administrations, shortcomings in the use of aviation trainers have been brought to light and simulator training of controller personnel has been organized in violation of MGA requirements.

The managers of administrations, academies, the Center for Civil Aviation of CEMA, educational institutions, and enterprises of civil aviation have been assigned the task of considering work to introduce and efficiently utilize simulator equipment as one of the basic directions of their activity.

The MGA Collegium also examined the problem of increasing the production capacities of plants and air maintenance bases in civil aviation. In the current five-year plan, production areas for ATB's [air maintenance bases] and repair

of aircraft engines have increased significantly. An increase in the production areas of ATB's of operations enterprises has made it possible to expand and more efficiently utilize the areas allocated for reliability and technical diagnostics laboratories, as well as to establish sections in many ATB's for preliminary assembly of engines, which has significantly reduced the downtimes of aircraft for technical maintenance and has raised the quality of aviation equipment assembly operations.

In Aviaremont and the Belorussian, Ukrainian and East Siberian administrations, advanced light metal structures (LMK) are being widely used to erect new production buildings and expand existing ones.

At the same time, there are shortcomings in the increase in production capacities of plants and ATB's in civil aviation. The target for construction of projects stipulated by the current five-year plan is not being completely fulfilled, and assimilation of capital investments is incomplete at civil aviation plants Nos 400, 410 and 421.

The reasons for the lag in fulfillment of the construction plan by plants and ATB's are unsatisfactory work by contracting organizations and inadequate work in organizing construction by the customer--Aviaremont and civil aviation administrations, plants and aviation enterprises, as well as poor provision for construction projects of rolled metal, pipe and construction materials by the MGA GUZSANT [possibly--Main Administration for Orders and Supply of Aircraft and Ground Equipment].

By its decree, the collegium made it incumbent upon managers of administrations, enterprises and organizations and plant directors in civil aviation to ensure complete fulfillment of established targets for increasing the volume and quality of repair on aircraft engines and for further improving their operation, and to take steps toward unconditional fulfillment of capital construction plans for 1984-1985 and in the 12th Five-Year Plan, bearing in mind that the commissioning of production areas for repair of aircraft engines and MIS [machine testing centers] is the first order of priority.

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CIVIL AVIATION

PLANT PHASES OUT TU-154B; TU-154M PRODUCTION BEGINS

Moscow SOVETSKAYA ROSSIYA in Russian 11 Aug 84 p 2

[Report by Kuybyshev correspondent M. Kashevnik: "They Are Gaining Altitude on the Ground"]

[Excerpts] It is like the mouth of a river: everything made in dozens of other shops flows here. But assembly itself also includes several stages before the final one is begun... The incessant din of drilling, riveting and pressing machinery resounds under the arches of the assembly and unit shop. Together with Petr Aleksandrovich Arkhipov, deputy chief technologist, I approach one of the presses. It is being operated by a young blonde woman, Lyudmila Stepanova. She is operating it skillfully and confidently. A push of the button, and 12 rivets punch the duralumin at one time.

"Do you know," asks Arkhipov, "how many rivets and bolts are in a finished aircraft? Over a million and a half! But after all, workers sometimes have to drill and rivet in almost inaccessible places. For this reason, we try to assign a large proportion of this work to automatic machines and machinery..."

Assembly is under way in several building bays at the same time. Here the middle part of the wing (the center wing), the detachable parts of the wing, and the trailing edge are ready... Assembly of the fuselage begins. Here the familiar outline of the aircraft appears for the first time. We climb a step-ladder onto the building bay. The hull of the Tu-154 is an unusual color--greenish-yellow, as if coated with primer. Cables wind throughout the interior and compressed air hisses. Not much time will elapse before the body of the aircraft will be "filled" with seats, luggage racks, lamps and carpet runners, and will take on the appearance of a comfortable passenger cabin.

The aircraft already is standing at its full height in the preliminary assembly shop. Practically all the components are connected together here. Arkhipov and I climbed the ladder to the tail fin. Here from the highest point of so-called "construction height," the vast shop was easily visible. It is so huge that even the nearly completed aircraft have room to spare here.

"See the aircraft over there?" asks Petr Aleksandrovich. "That is a Tu-154B. In several months we will forget about it and begin turning out only the 'M' model--the aircraft we are standing on. It is difficult to tell them apart from the outside, but the difference is substantial."

After the final assembly shop (it has been positioned right here behind enormous gates which partition off the hull) they will work with the aircraft at the plant flight test center. Its pilots and technicians are experts, skilled in their work. Hundreds of aircraft have passed through them before receiving a "license" for the right to fly.

...The test pilot. We recall first of all the ones who have passed judgment on fighter aircraft. But after all, passenger aircraft also undergo the same checkout, only an even lengthier one.

"Several years ago Nikolay Bugrov and I took up a scheduled series Tu-154," recalls Honored Test Pilot of the USSR Dmitriy Pavlovich Mart'yanov. "We took off, pulling back the yoke. Suddenly the aircraft, bouncing up sharply, began to increase pitch spontaneously. I'll explain: pitch is movement of an aircraft relative to the horizontal axis. The situation became very unpleasant. Bugrov (he was flying the aircraft) pushes the yoke forward, but considerable effort had to be applied here. The aircraft pitched forward. Again Nikolay pulled back on the yoke. And again it happened. 'Longitudinal oscillation,' as we call it, brought this about. Bugrov is an excellent pilot, physically strong and skilled. Neverthless, we flew the Tu-154 a little higher off the ground, and then landed the aircraft at the plant airfield. We got out and sat on the grass, wet with perspiration. We sit and say nothing... Anything can happen in our work..."

But this seldom happens. The aircraft being built at the Kuybyshev Aircraft Plant are of the highest quality.

"Recently we marked the 50th anniversary of our enterprise," said Hero of Socialist Labor Viktor Petrovich Zemets, general manager of the plant. "We have turned out thousands and thousands of airplanes over these years. The plant has given wings not only to aircraft, but to persons. A great deal can be accomplished with such a collective. We are now building the Tu-154M. The first two series aircraft are now in assembly. What will be new in this aircraft? The engines, to begin with. They are more economical, and their maximum thrust is greater than the previous ones--11 tons each. This will make it possible to select the most efficient flight regimes, and will substantially reduce fuel consumption compared with the Tu-154B--by approximately 15 percent. While the specialist will notice these changes first, the passenger will discover that the cabin has a new interior, the lighting has been changed, and the baggage shelves are the enclosed type. There are also other improvements. I believe the Tu-154M will board its first passengers this year..."

Our trip through the plant was approaching its conclusion when we nearly ran into a horse and cart at the shop exit. Driver Vasiliy Kondrat'yev had delivered provisions for the dining room in his Orlik. At first, a horse seemed to be a ridiculous anachronism. Electronics, robotics, manipulators, and somewhere at the end of a vast aircraft manufacturing conveyer--beautiful airliners, and here is a horse, almost the last century. But then we thought: perhaps this is not a coincidence--cart transport at an ultramodern enterprise. Perhaps someone decided--let the hooves clatter, reminding us of what is earthly and nearby? In the final analysis, the roaring engines which carry aircraft into the sky are measured in horsepower.

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BRIEFS

YAK-40 SERVICE FROM ROSTOV--Passenger flights between Rostov and Remontnoye, a considerable distance from the oblast center, have thus far been made in L-410 aircraft. They have not been able to fully meet the demand for air transport. Recently, a Yak-40 aircraft carried the first passengers from Rostov to Remontnoye. They were members of the administration's technical commission, which had come to the conclusion that the airport is basically ready to accommodate the new type of aircraft. After a little additional work it will be able to make regular passenger flights. Residents of the rayon center were very pleased to receive this news. They have to travel on buses for 10 hours to reach Rostov. Recently, air terminal complexes and paved runways to accommodate the Yak-40 were put into operation in such large cities in the oblast as Belaya Kalitva and Veshenskaya. [By G. Zhidkov, deputy chief of the North Caucasus Administration of Civil Aviation] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 4 Aug 84 p 3] 8936

KIRGHIZ RURAL AIR SERVICE--Osh (TASS)--The airport in the village of Batken was recently put into operation. A little over an hour now is required to cover the distance separating this remote region of Pamir-Altay from the capital of the Kirghiz SSR. In the mountainous region, where there are quite a few nearly inaccessible settlements, air communication is assuming more and more importance. Regular service has been organized with 19 rural rayons in the high mountains. Many kolkhozes and sovkhozes have their own airfields and airstrips used by agricultural aircraft which treat the fields, the alpine meadows and forests. By the end of the five-year plan, the volume of passenger and cargo transport by air in the republic will increase by nearly 1.5 times as much. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 25 Aug 84 p 3] 8936

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MOTOR VEHICLE INDUSTRY MINISTER ON FUTURE SOVIET VEHICLES

Moscow TRUD in Russian 26 Jul 84 p 2

[Interview with Viktor Nikolayevich Polyakov, minister of Motor Vehicle Industry, by S. Snegirev, "Trud" correspondent: "Tomorrow's Motor Vehicles", date and place not specified]

[Text] [Question] Viktor Nikolayevich, I probably will not be mistaken in saying that not a single branch of the national economy can manage without the motor vehicle?

[Answer] If you are talking about the role of motor vehicle transport in the economic life of the country, it has recently grown noticeably. The motor vehicle is the basic link between the various branches of industry and agriculture and between separate administrative-economic regions. It not only fulfills the independent function of transport, it links all the other aspects of transport into a single system. I will cite one more fact underscoring the growing importance of motor vehicle transport in our economy--the share of freight transport done by motor vehicle is increasing from year to year.

[Question] Yes, but to ensure such growth it would seem necessary to continually enlarge the motor vehicle fleet?

[Answer] This is one of the ways of solving the problem. But there is another one--raising the load-carrying capacity and productivity of vehicles and widening the use of truck trains in place of individual trucks. It is toward this, incidentally, that we are orienting ourselves in this and the 12th five-year plans. The development of the motor vehicle industry is directed right now not toward a quantitative increase in production volume, but toward qualitative changes and the assimilation of new improved vehicle models.

[Question] What are the chief demands you make on modern trucks?

[Answer] They can be briefly formulated like this: ensuring high productivity with low operational expenditures and minimal harmful effect on the environment. In other words, the vehicles should have the greatest possible load-carrying capacity with the smallest outfitted mass, high dynamic qualities, low fuel consumption, low toxicity and noisiness, and good working conditions for the driver. These requirements are taken into account on the new models that are being prepared for production at all our plants.

[Question] Doesn't the tendency to design large-capacity trucks lead, in the near future, to their completely supplanting their "littler" fellows--the trucks with small carrying capacities that are necessary in many spheres of urban economy, commerce, and public services?

[Answer] Such trucks are being produced and will continue to be produced at the Ulyanovsk and Yerevan plants. But since the demand for them is growing, a decision has been made to put up a new plant for the production of 1.5-ton trucks with diesel engines in the 12th five-year plan. This truck is designed as an urban vehicle for improved roads. On beginning its production we will be able to free all-wheel drive vehicles with cross-country capabilities from the Ulyanovsk plant for rural use.

[Question] Viktor Nikolayevich, since the present conversation has turned to the development of freight transport, we would like to hear about other new models.

[Answer] Then I will tell you briefly what is being done on this plan at our primary plants. In Minsk they have begun production of a group of trucks, including some with a load-carrying capacity of up to 30 tons, intended basically for operation as part of a highway truck train. Their use will allow the cost of transport to be reduced by 30 percent, fuel consumption to be decreased by 20 percent, and the volume of transport work to be increased without increasing the number of drivers. Such truck trains will help unburden rail transport by carrying out shipments more efficiently over short distances.

At the Gorky plant a diesel truck train with a load-carrying capacity of nine tons is being readied for production. GAZ [Gorky Motor Vehicle Plant] vehicles form the basis of the agricultural truck fleet, and the new dump truck train is intended primarily for operation on kolkhozes and sovkhozes. It will permit a two-fold increase in the productivity of transport operations in comparison with the individual gasoline-powered vehicles currently in use.

New ZIL [Moscow Motor Vehicle Plant imeni I.A. Likhachev] diesel truck trains will be able to transport up to 14 tons of freight. One feature of this vehicle is the modern cabin with a detachable fin assembly completed at the same time as the hood. Thanks to this, access to the power assembly is improved and the labor input for maintenance is substantially reduced.

The Kama plant group of vehicles is growing. They have begun production of an all-wheel drive model and also of an agricultural dump truck train with a load-carrying capacity of 14 tons. The adoption of diesel engines with turbo-supercharging, which will increase the vehicles' horsepower and their load-carrying capacity, is projected for KamAZ [Kama Motor Vehicle Plant] vehicles. A new model is being readied at the Kremenchug plant as well, where they are organizing production of a 16-ton construction dump truck.

Motor vehicle transport plays an important role in ensuring the efficient operation of the country's agricultural-industrial complex. Right now our branch produces 60 models of special vehicles and truck trains to fulfill the orders of agriculture. Before the end of the five-year plan 13 more new models

will be in production. In 1985 at the Kutaisi and Miyasse plants facilities will have been completed for the production, respectively, of the KAZ-4540 truck train, with a load-carrying capacity of 11.5 tons, and the Ural-5557 7-ton dump truck for use as part of a truck train. KAZ-4540 and Ural-5557 are suitable for shipping agricultural products out of the "heartlands" on dirt roads with low carrying capacity as well as in a single technological chain with other agricultural equipment.

On the basis of GAZ and ZIL diesel tractors, agricultural dump truck trains with carrying capacities of 8 and 12 tons respectively, will be put into production in the 12th five-year plan. The production of a number of other new specialized means of motor vehicle transport are planned for operation in the agricultural-industrial complex.

[Question] Judging by your answers, diesel vehicles will be getting the greatest preference in the branch in the future?

[Answer] At least their share in the general production of trucks will increase significantly. Next year we plan to put out up to 30 percent of all trucks with diesel engines. I'll remind you of the advantages of a diesel vehicle. It guarantees a fuel savings of 25 percent, and up to 40 percent when it operates in a truck train. In addition its service life is 1.5 times longer than that of a truck with a gasoline engine.

[Question] What other measures will be adopted for the solution of the fuel economy problem?

[Answer] I think that vehicles using compressed and liquefied gas will play an important role in its solution. Lot production of such vehicles has been begun at the Moscow and Gorky plants. But here too there are pluses and minuses. I'll try to explain. Right now we are producing vehicles that run on liquefied propane-butane. It is very effective. When propane-butane is used as fuel the exhaust gases are less toxic than those of gasoline. But, unfortunately, the quantity of this gas is limited, therefore we cannot use it widely. On the other hand, our country has huge supplies of natural gas which, in its compressed form, replaces liquid fuel perfectly. But for this it is necessary to set up an entire network of filling compressor stations. After all, gas needs to be compressed to 200 atmospheres. However, the construction of such stations is proceeding with long delays. In addition, special tanks are required for the use of compressed gas, and so far we are receiving them from USSR Minchermet in insufficient quantity. All this delays the mass production of vehicles that operate on compressed gas.

[Question] It has already been reported in print that the leading enterprises in passenger car production, VAZ [Volga Motor Vehicle Plant], AZLK [Moscow Lenin Komsomol Motor Vehicle Plant], and ZAZ [Zaporozhe Motor Vehicle Plant], are converting to the production principally of new front-wheel drive cars. I had occasion to see these vehicles and observe all their advantages, which were described in detail in "Trud". But I got the impression that with putting the front-wheel drive models into production, these enterprises are curtailing production of vehicles with rear-wheel drive.

[Answer] Only AZLK and ZAZ are going completely over to the production of front-wheel drive models. At the Volga plant rear-wheel drive vehicles will be produced side by side with the VAZ-2108 and, in the future, with other front-wheel drive models. The Gorky and Izhevskiy plants' passenger cars will retain the traditional design. But it is incorrect to think that the rear-wheel drive group of passenger cars will not be reinforced with new models.

[Question] And when will the domestic compact car appear?

[Answer] That car is being developed. It will be smaller and lighter than a Zaporozhets. The vehicle is designed for two adult passengers and two children. It is supposed to be equipped with a 2-cylinder, 30 horsepower engine.

[Question] You talked about the use of diesel engines in trucks. Are there plans to use them in passenger cars?

[Answer] The dieselization of passenger cars is not a pressing need so far. The chief task is to provide trucks with diesels. Nevertheless, a diesel engine for Zhigulis has been developed at VAZ. It has been designed on the basis of the VAZ-2103 carburetor engine. In order to develop the design and improve the technical and economic parameters, a lot of diesel Zhigulis will be produced in this five-year plan.

[Question] Viktor Nikolayevich, in speaking of vehicles for individual use it seems impossible to avoid the sore subject of the problem of repairs and spare parts.

[Answer] This really is a sore subject. I will remind you that the firm system of passenger car maintenance was first established in our country with the beginning of the production of VAZ vehicles. At the present time 48 VAZ special vehicle centers and 500 maintenance stations are in operation. The completion of 222 more maintenance stations and 5 special vehicle centers is projected before 1987. The firm system of Zaporozhets and Moskvich maintenance is being enlarged after the VAZ example. Nonetheless, the problem of repairs and spare parts supply has so far not been completely solved for various reasons. In particular, the elimination of certain design defects was delayed. For example, on the VAZ, the system of valve gears turned out not to be sufficiently reliable. There were also defects in the cardan joints. They lead to premature wear of certain parts and assemblies. At all our plants work is presently being conducted to eliminate such defects.

There is one more important reason: the service life of passenger cars is getting much longer. We hardly write any of them off. And at one time there was a period for these very Zhigulis, nine years, after which the vehicle should be written off. But this isn't happening. As a result, all the initial calculations of the growth of the fleet and production of spare parts for it are obsolete. And we were not able to increase spare parts production capabilities in time and were delayed in solving the problem of the repair of passenger car assemblies.

[Question] And what is the way out of this situation now?

[Answer] We have taken measures to increase the production of spare parts. For example, after the 2108 model has been put into mass production at VAZ, one of the technological chains will be completely converted to the production of spare parts. In addition, we are expanding efforts to increase the life of assemblies and parts in the scarce range of products. In particular, at VAZ a camshaft nitriding process has been introduced and the technology for assembling the drive shaft universal joints has been improved. Similar measures will raise the reliability and lifespan of scarce parts. In the AvtoVAZ, Moskvich, and AvtoZAZ associations they plan to build new plants for rebuilding used parts and assemblies. Of course I cannot say that the shortage problem will be completely solved soon. There are a number of parts that are limited in quantity by material resources. For example, many bodies, fenders, and hoods are in constant demand. We cannot produce them in large quantity; this has to do with a shortage of cold-rolled sheet. Therefore we are taking measures to enlarge and reconstruct tinsmith-body and paint sections. We expect the spare parts and repair situation to improve in the near future.

[Question] Viktor Nikolayevich, today the AvtoVAZ, Moskvich, and AvtoZAZ associations themselves decide in what quantity to produce these or other spare parts. Only a limited range of spare parts and the general volume of their production is under the control of the ministry. What gave rise to this situation? Is it not one of the reasons for the irregular supply of spare parts to the maintenance system?

[Answer] I already mentioned that we were expanding the firm system of vehicle maintenance after the VAZ example. And can it be effective in the absence of local initiative, under conditions where all decisions are dictated from the top? I think not. The directors of the enterprises should themselves regulate the volume of spare parts produced and make an effort to have vehicles undergo any necessary repairs. In the firm system of vehicle maintenance we strive to uphold this principle: to increase the independence of the association and their responsibility for the operation of vehicles. And the fact that a small range of scarce spare parts is still under the ministry's control means that still not all enterprise directors regard the solution of the vehicle repair and maintenance problem with the proper measure of responsibility.

[Question] Comrade minister, to conclude our conversation we would like to hear about the further development of motor vehicle transport for general use.

[Answer] New bus models will appear on city streets in the current five-year plan. Among them I can name the LAZ-4202 with automatic transmission, which the Lvov factory has begun to produce. The Pavlovskiy PAZ-3205 bus, providing a greater capacity and increased comfort over its predecessor, will appear on local transportation lines. In place of the LiAZ-677M model, much criticized by drivers, the Likinskiy plant has begun to organize production of the new large-capacity LiAZ-5256 bus with a diesel engine. Hungarian auto builders are participating in the development of the design of this model and in the organization of its production. The microbus group will be reinforced as well. Lot production of the modernized RAF-22038 microbus is set for the beginning of the 12th five-year plan. The trolleybuses put out by the plant imeni Uritskiy will also undergo extensive improvement. They will have a modern interior and more comfortable conditions.

12461
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MINISTRY QUALIFIES SUPPORT FOR BAM HIGHWAY CONSTRUCTION

Moscow IZVESTIYA in Russian 3 Aug 84 p 2

[Deputy Minister of Transport Construction, USSR, V. Alekseyev, replies to questions of traveling editor on article titled: "A Road Along the Road"]

[Text] The position of our ministry on the question raised in the article "A Road Along the Road" (No 201/202), is as follows: the automobile highway along the BAM was undoubtedly needed, and we are ready to take part in completing its construction through contracter organizations. At the present time the road stretches 3,100 kilometers, from Ust' Kut to the village of Postyshevo in Khabarovsk Kray. Quite a significant amount of funds were invested in its construction--about 400 million rubles--and it was built basically as a category five road, which was suitable for its purposes at that period of time. The road surface is for the most part crushed gravel. Culverts for streambeds were made of corrugated metal. The medium and large bridges were built with metal spans.

It goes without saying that in its years of service the highway has "worn out" and requires further construction--but not, in our opinion, to the extent that Minavtodor [Ministry of Highways] RSFSR described: he asserts that during its construction, there were deviations from the plan; that engineering specifications were grossly violated; and that the majority of the man-made structures are in dangerous condition.

Nor is the opinion entirely factual that the road, for almost its entire length, was built on the railroad right-of-way, that there are many railroad crossings at the same grade, and that therefore new routes and new construction are required.

All of this taken together permits us to speak with confidence of the fact that the highway route along the BAM can be completed. If, as they say, there were only a manager who is seriously concerned over whether there should be a road--whether it should be completed.

The example of Buryatiya shows that local government organs can become such a manager; for they could unite all the enterprises situated in their regions on the principle of share-and-share-alike. Specifically, this is how the sector from Severobaykal'sk to Kicherma, 66 km, was completed. Funds for this purpose were transferred by the Ministry of Railroads to the account of the ispolkom of the Soviet of People's Deputies.

Such a combination of efforts must be brought to bear as well at the level of the ministries and departments which are taking part in the creation of territorial-industrial complexes and industrial centers; of kolkhozes and sovkhozes; cities and workers' settlements in the BAM zone. And capital investments should be provided for them for the needs of the highway.

As concerns the participation of our contract organizations in completing the construction of the highway, we place the estimated value of their work at 100-200 million rubles. This will permit upgrading the highway for its entire length from a category five to a category four road. The question of further upgrading the category of the highway should, in our opinion, be settled in stages.

9006
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INSTITUTE DIRECTOR ON SOVIET MOTORCYCLE DESIGN TRENDS

Moscow ZA RULEM in Russian No 7, Jul 84 pp 10-11

[Interview with Viktor Danilovich Boguslavskiy, director of the All-Union Scientific-Research Institute of Motorcycle Building and Light Engines (VNII motoprom): "Mopeds for Every Taste", date and place not specified]

> [Text] In recent years our press has published many articles dedicated to these vehicles. Chiefly critical ones. The demand for mopeds has fallen. The trading network is overstocked with unsold products. In order to clarify the reasons for this and to find out what measures have been projected, the editors turned to V.D. Boguslavskiy, director of the All-Union Scientific-Research Institute of Motorcycle Building and Light Engines (VNIImotoprom).

[Question] Viktor Danilovich, by how much has the demand for mopeds in our country fallen in recent years?

[Answer] Three plants that were producing mopeds and mokicks, the Riga, Lvov, and Penza plants, held steady at approximately one level for several years: 713-728,000 vehicles per year. This volume corresponded to the demand that had been established for them at one time. But after an increase in production that was unconfirmed by demand, the vehicle market began to fall sharply, and last year we had to curtail production of mopeds in Penza and reduce it appreciably in Riga and Lvov. As a result, production has been cut almost in half.

[Question] Maybe the loss of interest in mopeds is a side-effect of the development of motorization?

[Answer] No, that is not so. The growth in the number of automobiles for personal use may entail a decrease in the demand for motorcycles--for those that were, to a certain extent, an inexpensive alternative to an automobile--but not for mopeds.

The point is that the moped, developed from a combination of a bicycle and a light motor, has always had and will have in all countries a stable group of consumers with their own transport requirements. Look at the number of two-wheeled vehicles today in France and Italy--mopeds, mokicks, mofas, mini-bikes,

micro-scooters--it is very large and does not show a tendency to decrease. And this is while the number of passenger cars is growing. Moreover, vehicles whose engines have a displacement of under 50 cubic centimeters comprise 36 percent of world production of two-wheeled transport.

[Question] But if that is true, what gave rise to the decreased demand for mopeds here?

[Answer] I see three primary reasons, closely related to one another. The first is the decreasing quality of the manufacturing of the vehicles, primarily of the engines. Second, the absence of technological advances in moped design and their insufficient consumer qualities. And third, the narrowness and limitedness of models of mopeds and mokicks. As a result, three models that were in production in 1983, just by virtue of their universality did not satisfy the demands of a significant number of potential customers.

[Question] But wasn't the potential variety of motorcycles in general as well as that of their lightest variety, mopeds and mokicks, established on a scientific basis, wasn't it studied?

[Answer] Yes, it was. But the criteria that determined consumer needs at that time have changed now. In recent years the prosperity of the population has increased; operating conditions, demand, and fashion have also changed. In a word, life moved on and the plants forfeited their consumer feedback. It is no secret that at times the calculation of demand for isolated goods and its circumstances are unequal to the occasion. This is exactly the case with mopeds.

[Question] Let's go to the most important thing. What has already been done to correct the current situation and what is planned for the future?

[Answer] A moped is first of all the engine: SH-62M from the Shyaulyay Vayras plant, and D-8 from Leningrad's Red October plant. Both designs are obsolete and insufficiently reliable, and the quality of manufacturing frequently leaves much to be desired.

First of all, measures had to be taken to strengthen technological discipline and increase the requirements on the enterprise-suppliers of component goods, and to modernize the engines.

[Question] And what specifically has been done?

[Answer] Consumers complained about frequent breakdowns of gears in the transmission. In order to eliminate this defect, Vayras completely renovated the stock of gear-cutting machines, instituted shaving (finishing treatment for the teeth), and revised the technology of heat treatment for shafts and gears in the transmission. In the interests of increasing the reliability and longevity of the cylinder-piston group, a completely new technology has been instituted for treating the cylinder sleeves.

There have been many criticisms of the operation of the generators supplied to Vayras by the Ordzhonikidze motor-tractor electrical equipment plant. After

measures were taken in connection with this it sharply increased the quality of the generators and virtually eliminated defects like breakage in the last coil of the rotor's winding.

At the same time, Shyaulyay plant specialists revised the design of their engine. A more reliable and improved motor, the V-50, is already being produced ("Za rulem", 1984, No 5).

This is the first step. The next one is completely assimilating the new designs. The D-8 will be replaced by an engine that is scheduled for production beginning in 1987; we will conditionally call it "class 'A' motor".

A centrifugal automatic transmission is planned for the projected power-generating set. As far as the V-50 is concerned, a completely new engine is planned to take its place (we will say type "B"), which will be basic to the large class of power-generating sets with displacement of 50-80 cubic centimeters, capacity of 2.5, 3.5, and 6 horsepower, and 3 or 4 gears. Lot production of them is projected to begin in 1987.

[Question] You mean this year will be pivotal in the renovation of the chief element of our mopeds?

[Answer] It should be. But for this it is necessary to carry out the conversion of Vayras and fit it out with the necessary equipment.

A new building, with an area of 20,000 square meters, is being constructed at the plant now. In the near future more than 200 automated machine units and automated lines will be installed here as well as many highly accurate finishing tools. In addition, the heat-treating and electroplating shops will be retooled; the longevity of parts depends specifically on their work.

On the whole the renovation of the enterprise, which will be completed during the current five-year plan, will not only allow the quality of engines to be sharply increased in the 12th five-year plan and the production of new models to be organized, it will allow the yearly production volume to be increased to 400 thousand motors.

[Question] You touched on the measures called upon to eliminate the first two reasons for the decline in demand, marketing, and production of mopeds, and only partially on the third reason. What will be undertaken in the area of selection besides the preparation of classes of various capacity engines?

[Answer] Improved models of mokick (that is a moped where the engine starts not by means of pedals, but with a kick-starter) in four models, Standart, Turist, Sport, and Lyuks, as well as a mini-mokick in two models, Standart and Lyuks, have been projected by the Riga and Lvov plants for production in the next few years. They will start producing them this year in Lvov and Riga with the V-50 motor (the gear shift lever is on the handlebars). Beginning in 1985 they will be assembled with V501 engines (toe gear shift).

Besides this, the Lvov motor plant plans to organize production of a mini-scooter of the 500 cubic centimeter class in 1986. Over the longer term they will start producing several models of a micro-motorcycle (mini-bike) with class "A" motors.

Experimental models of certain designs can already be shown--you see them in the photos [not reproduced]. In order to adapt more flexibly the models and modifications being produced to the demand, the vehicles will be available with regular or raised fenders and mufflers, baggage carriers or saddle bags, cast or stamped wheels, and various types of decorative elements. And, of course, the engines should provide a variety of assortment. Three different cooling systems (air flow--front approach or from a fan--and fluid) have been stipulated for them as well as two types of gas distribution control (one traditional and one with the addition of a lobed valve), two varieties of starter (pedal and kick-starter), and two types of transmission drive (hand and toe).

[Question] And on which basic consumer groups are these planned vehicles relying? It seems primarily on village inhabitants?

[Answer] They are not the only consumers of mopeds, mokicks, and micro-scooters. Picture this. You are a city dweller who has set out for the countryside in his Zhiguli--a fishing trip, mushroom hunting, or just for the fresh air. The pavement ends. How do you go on? It's simple--you have a collapsible mini-scooter or mini-bike in the trunk. Pull it out, assemble it, and you can have a range of several kilometers from the "base" of your car! And shopping trips within a block of a large city? And young people's mopeds, which would be better defined as recreational equipment than as a means of transportation? And a light moped for the trip from a factory settlement to work and back? One can name dozens of specific applications for two-wheeled motor transport of the 50-80 cubic centimeter class. Although I will say that, as before, the primary consumer of mopeds and mokicks will be found in the village. A precise answer to the question of which consumer needs which vehicle and where can be given on the basis of the application questionnaire. This is not simple, but it is necessary.

[Question] So, with a clearly known demand for the individual types of mopeds, mokicks, micro-scooters, and mini-bikes and with the renovation of plants, which will allow the demand to be satisfied, the customer's interest in this category of vehicle should revive?

[Answer] Absolutely. On the condition, of course, that new modern designs are developed. Then one could count on an annual demand for 500-600,000 vehicles.

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GREATER USE OF ELECTRICALLY POWERED VEHICLES URGED

Moscow AVTOMOBIL'NYY TRANSPORT in Russian No 5, May 84 pp 46-48

[Article by B. Busygin, candidate of technical sciences (MADI) [Moscow Motor Vehicle-Road Institute], A. Nevelev, professor and Candidate of economic sciences (MAMI) [Moscow Automechanical Institute], and V. Torshin, engineer (MADI):
"Electrically Powered Vehicles"]

> [Text] How can a large modern city be spared the noise of motor vehicle engines and the toxic substances given off with exhaust gases? One of the ways of solving this problem today is the use of electrically powered vehicles where their application can be economically advantageous.

The operation of experimental lots of LAZ-NAMI battery-powered electric vehicles in 1949-1958 indicated the advisability of their use in cities. Today this has been confirmed by the experience of the Mostorgtrans integrated vehicle works No 34, where UAZ [Ulyanovsk Motor Vehicle Plant], VAZ [Volga Motor Vehicle Plant], ErAZ [Erevan Motor Vehicle Plant], and RAF [expansion unknown] electric vehicles, which the industry produces in small quantities, are in operation. (See table 1).

The work of the Institute of Complex Transport Problems, under USSR Gosplan, shows that battery-powered electric trucks with nickel-iron batteries are economically effective if they are used on city shipments instead of trucks with gasoline engines and load-carrying capacities of up to 1.5 tons. Electric vehicles might also find application in urban public services.

It is very important to treat the electric vehicle not as a rival of the motor vehicle, but as a type of transport that should be used in those areas where the use of motor vehicles is unprofitable.

The use of electric vehicles allows a reduction in air pollution in the country's large cities and resort centers as well as a reduction in the demand for light petroleum products. However the prototype electric vehicles still cannot be widely used in the national economy because they are not sufficiently reliable, the longevity of the batteries and electric drive systems is low, and there is no broad network of battery-charging and maintenance stations.

An analysis of domestic and foreign electric vehicles shows that one of the basic parameters, the range, in city conditions today does not exceed 60-100 kilometers. At the same time, we know that the specific power to weight ratio, which is defined as the relationship of the battery's energy supply (kilowatts·hours) to the total mass of the electric vehicle (kilograms), exerts the primary influence on the length of the range. The specific power to weight ratio depends on the specific power-intensiveness of the batteries (Watts·hours/kilograms) and the relationship of battery mass to the total mass of the electric vehicle. All this determines the possible use scales for electric vehicles.

The design of electrically powered vehicles is much more varied and not as stable as the design of motor vehicles. There are electric vehicles where the electric motor is in the front and the drive wheels in the back. There are front-wheel drive models and models with motor wheels. The batteries on an electric vehicle may be situated on both sides of the body (the classic arrangement) or under the floor of the body, going in on one side and extending on the other (on front-wheel drive models). And on the Andersen electric vehicle (USA), the battery unit fills the center tunnel of the body (it is as though is is situated in the tunnel for the drive shaft).

Of course the variety of design treatments is not exhausted by the enumerated examples. But this shows that the search continues for a more advantageous lay-out for an electric vehicle.

In creating electrically powered vehicles, designers today are adhering basically to two trends. In the first, the design of the electric vehicle is linked with the assemblies of a mass-produced motor vehicle (rear and front axles, frame, etc). The electric vehicles made in our country on the basis of UAZ and ErAZ vans, RAF microbuses, and the VAZ-2102 passenger car belong to this trend. They can be seen on the roads of Moscow, Riga, Ulyanovsk, and other cities.

The specific designs in which, for example, motor wheels, an electric motor combined with the rear axle, etc. are used pertain to the second trend in electric vehicle design. This treatment allows the design of a more compact electrically powered vehicle.

If both ways of developing an electric vehicle are evaluated from the point of view of economy, then the second way should be considered more correct. It would justify itself in full-scale production, although experimental lots of electrically powered vehicles based on motor vehicles would be cheaper.

The most active of our designers are developing original electric vehicles. For example, the model A-925.01 van designed by specialists at NIIAT [Scientific Research Institute for Motor Vehicle Transport] and VNII [All-Union Scientific Research Institute] for Electrically Powered Transport, and the VAZ-2802 electrically powered truck.

And specialists at the Kazakh SSR Academy of Sciences Institute of Mining have designed a large-capacity electrically powered dump truck (load-carrying capacity 20 tons). It is intended for operation in quarries and mines, where it is no less important than in the cities to keep the air clean.

Alkaline batteries are the power source for the dump truck. It operates on them in the stope, having a range of only several kilometers (such a dump truck does not need more). In the main openings the dump truck becomes a trolley bus. At that time the batteries receive a boost charge.

Incidentally, similar treatments in the design of electrically powered vehicle transport are also possible. In the FRG, for example, buses are in use whose diesel turns a generator that produces a current for the pulling electric motor and boost charges for the battery unit. Within the boundaries of the city such a bus operates on the batteries, and beyond them the diesel turns on.

In order to lessen the mass of a diesel-electric bus the battery unit may be placed on a small trailer. True, in this case it is necessary to increase the length of the road train.

The total mass of an electrically powered vehicle today is greater than the mass of a motor vehicle with an internal combustion engine. However, with the appearance of new building materials this difference is becoming smaller and smaller. Lightened frames, plastic bodies, etc. are being used more often in the design of electric vehicles. Batteries and electric motors are becoming lighter as well.

When the specific power-intensiveness of an electric vehicle reaches 100 Watts·hours/kilogram (under a 5-hour charging regime) with a service life of no less than several hundred cycles and an increase in range up to 200 kilometers and more, the adviseable use scale for electrically powered vehicles likewise increases. This will decrease the demand for gasoline by more than 20 percent and the urban air pollution caused by motor vehicles by almost 90 percent.

In our country work, important in terms of both volume and scientific significance, is being conducted and planned in connection with the development of electrically powered vehicle transport. In connection with this, new specialists will be required in motor vehicle transport. USSR Gosplan and USSR Minvuz are providing for this in their plans.

Certain specialists think that electric vehicle use scales today are limited. The demand for them will not exceed 100-120 thousand units in the near future. However, it is necessary to build electrically powered vehicles and develop their design.

Municipal transport provides for the vital activity of a city as an integrated system with its administrative, national economic, cultural-educational, and other functions. However, the modern passenger car, able to reach a speed of up to 200 kilometers per hour, sometimes moves along the streets of large cities during the rush hour at the speed of a pedestrian--4-5 kilometers per hour.

The above figures, which should take into consideration the participation of a limited fleet of electrically powered vehicles, indicate that the necessity of improving the organization of city shipments and traffic is imminent.

The total world fleet of electrically powered vehicles is continually growing. Active efforts in the design of electric vehicles are ongoing in many countries.

In the USSR, USA, England, FRG, and Japan they are working on the design of an electrically powered vehicle with combined power plants and energy regeneration. In the USA they think that in spite of the high cost and limited range and speed of electric vehicles, as well as the difficulties in designing large-capacity batteries, electric vehicles possess such important qualities as noiselessness, a high level of cross-country capability in roadless areas, and mobility.

Electrically powered vehicles are profitable when they are used in urban operating conditions--short distances, frequent stops, heavy traffic. This is why electrically powered vehicles are today already fairly widely used for urban hauling of small lots of freight, produce, mail, delivering linens from laundries, collecting and hauling away garbage, cleaning and flushing streets, etc. In order to complete these types of transport jobs, it is enough to have a range of 50-60 kilometers and a speed of 40-60 kilometers per hour. Modern battery-powered vehicles of the transport type have these features.

The Japanese MITI [expansion unknown] firm's electric vehicles, whose characteristics exceed the corresponding indicators of other countries' electric vehicles, are of interest. For example, at a speed of 40 kilometers per hour the range of a MITI vehicle is 496 kilometers if zinc-air and lead-acid batteries are used, and 302 kilometers if the improved lead-acid batteries are used. But we will again emphasize that these electric vehicles are experimental, and their cost is much higher than that of the electric vehicles produced by industry.

Another important point is the scientifically based organization of charging and replacement stations. In London, for example, modern power sources give electrically powered taxis an average daily range of 250-300 kilometers.

The use of electric vehicles has great significance for the national economy. One thousand electrically powered vehicles with a 3-ton load-carrying capacity and 15 thousand kilometers logged annually will allow a savings of about 4.5 thousand tons of gasoline per year. Instead of petroleum fuel, these electric vehicles will require 7 million kilowatt-hours of electrical energy annually, which will give electric power stations an additional nightly load.

Increasing the night load of electric power stations, especially the atomic ones, is highly desirable as it levels the load curve and lowers the cost of electrical energy produced. Electric power stations are interested in attracting nighttime consumers of electrical energy and are encouraging them with lower rates.

The approximate calculated annual productivity of electrically powered vehicles, determined by their daily runs operating in eight-hour days, is cited in table 2. However, available experience in electric vehicle operation indicates that operating conditions (frequent stops, etc.) do not always permit this maximum productivity to be reached. Foreign specialists are oriented in their calculations toward 15-18 thousand kilometers logged annually on an electric vehicle, operating it on one shift.

The service life of an electrically powered vehicle may reach 25 years, with total kilometers logged up to 500 thousand. The period of its depreciation is considered equal to 12 years. After this time the electric vehicle becomes so obsolete, that it is advantageous to replace it with a new model.

Repair expenditures are not high for electrically powered vehicles. This is explained by the simplicity of repairing an electric motor and other apparatus and the smaller amount of time an electric vehicle spends idle for repairs. Total expenditures on repairs depend on the service life of the electric vehicle and on kilometers logged daily. The average cost of repairs for an electric vehicle is 15-21 percent of yearly operating costs. For a motor vehicle with an internal combustion engine this cost is 30-35 percent. Based on foreign data, it can be assumed that the cost of repairing an electrically powered vehicle is 2.5-3 times cheaper than that of repairing a motor vehicle that was operated under approximately the same conditions.

Calculations have shown that the most decisive factors affecting the profitability of an electric vehicle are the quality and cost of batteries. The greatest possible attention should be paid to the organization of charging and control over batteries in order to ensure their correct use.

The majority of specialists think that correct and inexpensive operation of electric vehicles can be attained only in a large fleet.

An electrically powered vehicle is not as dynamic as a motor vehicle with an internal combustion engine. However, an electrically powered vehicle's dynamic indicators are more stable, which makes it easier to drive. Besides this, an electric vehicle picks up speed more smoothly when the road's resistance is great. This smoothness depends little on the skill of the driver, whereas, in driving a motor vehicle in a similar situation the driver's experience plays a significant role.

When the average operating speed of a motor vehicle is determined, the number and duration of stops on the route are taken into consideration. The time needed for starting the engine (if it was stopped) and shifting the transmission also affects the magnitude of this speed. The driver of an electrically powered vehicle does not have to shift gears. Therefore the operating speed of a motor vehicle often turns out to be lower than that of an electric vehicle.

Thus, travel with frequent stops is a regime under which the specific properties of an electrically powered vehicle are seen from their best side.

The specific significance of various speed regimes in electric vehicle operation may change within significant limits. It depends on the type of shipment (freight, passengers, special), on the number of stops and the distance between them, and on road, climatic, and other conditions. Therefore designers, in making one or another type of electric vehicle, take into consideration those work regimes which will predominate in its operation.

In general, speed regimes for operating an electrically powered vehicle are formed from the following stages: acceleration from a dead stop up to the necessary speed; uniform motion at speeds, that may be taken as established, equal to the final speed of acceleration; slowing (from a speed equal to the speed of acceleration or established motion); braking to a complete stop.

In operating an electrically powered vehicle under real conditions, still other stages are encountered in individual cases. However, in any case the motion of

an electrically powered vehicle cannot avoid accelerating, slowing, and stopping. Therefore one can say that the closed cycle, with beginning and ending speeds equal to zero, is the general case of electric vehicle motion.

Owing to various combinations of the stages of motion enumerated above, cycles can be most various in form and size. The most various of them are observed when the electric vehicle operates with frequent irregular and chance disturbances and stops. As, for example, it operates in city traffic.

Factual operational cycles have great variety, which makes analysis of them difficult. The replacement of factual (operational) cycles of motion with model ones allows the determination of speed properties and the energy expenditure of electrically powered vehicles originating from individual model cycles. The use of similar cycles creates a real opportunity to imitate the operational regimes of electric vehicles with sufficient precision and with the maintenance of appropriate road and other conditions.

The electrically powered vehicle will be used as a type of motor vehicle transport where is is profitable according to the type of work. Possible use scales for electric vehicles in cities will depend not only on technical indicators, but on their configuration as well, and that means on economic advisability. The production and operation of electrically powered vehicles demands the speedy generation of correct scientifically based methods of their development. Modern domestic and foreign experience in the use of electrically powered vehicles allows this to be done.

Table 1

Designation of products put out	Year of production, Units				Motor vehicle plant-manufacturer
	1981-1985 in all	1983	1984	1985	
Electric vehicles and buses, in all	361	60	75	155	-
Electric vans, 500-kg load-carrying capacity, alternating current electric-drive	81	15	15	35	UAZ
Electric vans, 300-500-kg load-carrying capacity	125	20	30	55	VAZ
Electric vans, 800-kg load-carrying capacity, constant current electric-drive	73	10	13	35	ErAZ
Electric buses, constant current electric-drive	82	15	17	30	RAF
Constant current electric-drive systems (assemblies)	135	22	33	58	VAZ

Table 2

Load-carrying capacity of electric vehicle, tons	Range on one battery charge, km	Annual range, km	Annual productivity, ton·km
1.5	80	24,000	36,000
3.0	65	19,500	58,500
5.0	50	15,000	75,000

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VEHICLE TESTING, PRODUCTION LINE IMPROVEMENTS AT KAMAZ

Moscow PRAVDA in Russian 9, 10 Jul 84

[Article by S. Bogatko and N. Morozov, "Pravda" special correspondents: "KamAZ: the Path to Perfection"]

[9 Jul 84 p 3]

[Text] Brezhnev, Tatar ASSR--1. What can a vehicle "endure"?

The truck that was standing on the edge of the asphalt site differed noticeably from all its fellows in the KamAZ [Kama Motor Vehicle Plant] class.

"It has just been assembled in the experimental shop," explained V. Barun, chief designer for the Kama association for the production of large-capacity vehicles. "This is the KamAZ of the near future. Do you want to test it?"

One of us had a commercial driver's license and we took a few turns in the brand new vehicle. Of course an easy run cannot be called testing. But they say that a first impression is very accurate. What benefits were added in the new model? More comfort and operating conveniences, increased load-carrying capacity. But the main change was different; the model is biaxial...

It must be said that a third axle was not excessive at first. It would provide for the preservation of roads with poor surfaces and passage over fairly weak bridges. But the road network in the country is improving and in many cases, especially on intercity transit routes, a third axle will become a burden. The need has arisen to diversify the KamAZ class, and the opportunity has arisen to decrease the weight of part of the vehicles produced and to conserve a huge quantity of rubber, fuel, parts...

Probably not all drivers know that since the time the first KamAZ was produced (1976) 3500 technical-design changes have been made in it. Reliability and economy are the basic trends in the thinking of the designers of Kama large-capacity trucks. The goal--to obtain the greatest effect from the adoption of a vehicle in the national economy. The truck was lightened by hundreds of kilograms. Its service life increased from 115 thousand total kilometers logged to 290 thousand. The projected level (350 thousand kilometers) has still not been reached, but in capable hands the vehicle frequently lasts still longer. Here are a few letters from users of the Kama trucks.

"I have been behind the wheel of a KamAZ for more than five years," says Y. Bersenev, a driver for Sverdlovsk Oblkolkhozstroy, "I've already put 400 thousand kilometers on the speedometer. And so far I haven't done major repairs. Although I've worked with a trailer, hauled reinforced concrete and brick, and driven only on rural dirt roads... An entirely reliable vehicle!"

"At our enterprise 18 KamAZ trucks have already gone more than half a million kilometers without an overhaul, and continue to go on long hauls," reports N. Ivanov, manager of the Altaystroytrans trust.

Letters of similar content addressed to the chief designer make up thick volumes. The opinion of the majority was concisely expressed by V. Maksimenko, a driver in the northern Don, "KamAZ has great influence with our brother-driver!"

The Kama truck also has international credentials that confirm its complete compliance with modern requirements pertaining to ecology and safety equipment. And finally, we will cite official evidence: six of the eight KamAZ models carry the Mark of quality.

In terms of fuel consumption, Kama vehicles are more economical than other vehicles of a similar class. And in the coming five-year plan the fuel requirements will be still more economical; the designers have developed an improved fuel system, a supercharging system, and "faster" tires.

Vehicles from Kama which are capable, with trailers, of transporting up to 20 tons of freight (potentially up to 38 tons) are presently being bought by dozens of countries. And new agreements are always being concluded for the delivery of vehicles both in finished and knocked-down form. KamAZ trucks are gaining new uses and finding application in agricultural work, public services, firefighting, construction...

At one time, the first to have passage on the former Quay Shuttle took pride in being participants in the great project. Today, with half a million large-capacity trucks on the road, a battle is being waged among Kama auto builders so that the vehicle that comes off the conveyor with the number 1,000,000 on the cab also has the symbolic worldwide Mark of quality, that is for it to be genuinely unsurpassed in its class. There are still a number of opportunities for perfecting the KamAZ truck. V. Azarov, technical director of the association, noted one of the problems that occupy the Kama workers now: the vehicle's too high specific consumption of materials.

"Certain models of today's KamAZ are carrying, according to our calculations, up to half a ton of unnecessary weight," he said. "And the designers are actively searching for ways to help the large-capacity truck 'lose weight'. Strictly speaking not only they are occupied with the search. The foundry men are doing a great deal in this plan. They intend to increase the output of castings from high-strength cast iron, which will allow the weight of every vehicle to be reduced by 100 kilograms by the end of the current five-year plan. More precisely, to remove a quintal of mass from the vehicle in order to add a quintal of freight in the body."

But not everything depends on the Kama workers. Business is severely hampered by lags on the part of certain suppliers in the chemical industry. Auto workers, for example, have for some years been asking the chemists to adjust their output of high-quality gaskets. They did not respond. A one-kopeck rubber gasket breaks down, and the driver says the engine is bad. Of course big chemistry is not interested in dealing with "trivial problems". But from the point of view of the interests of the entire national economy, the responsibility for lagging behind in this type of "trivial problem" should be no less than for the fulfillment of the plan on schedule. Many parts could be successfully manufactured from glass-reinforced plastic, polystyrene, and other inexpensive light materials; ceramet and powder alloys could be adopted...

The designers are well aware of the vehicle's weaknesses. According to them a considerable backlog of solutions has been established, but putting a more perfect model into quantity production is not so simple. The Kama association has hundreds of suppliers, among whom there are a number that react too cautiously to the vehicle builders' new suggestions. Especially demanding of attention is the tire plant workers' underfulfillment of quotas. They are delaying too much with the new "shoes" for Kama trucks. Similar inertia is evident in other fields as well.

And the Kama workers themselves still have flaws in the stage where innovations are introduced. Customers are raising many fair claims on a number of parts and assemblies, and on the quality of vehicle assembly. However, the transporters, those who use KamAZ trucks, often have an insufficient understanding of the fact that the vehicle is not simply new. It is one of a new generation, and requires more competent, precisely regulated servicing and maintenance. And the point here is not even volume of work, but technological discipline. For example, there are fewer lubrication points than on the old generation of truck, and the oil does not have to be changed as often. But what has been authorized must definitely be done. The KamAZ is a precise vehicle and does not tolerate carelessness. And that is why, once in a while, among drivers' comments on the large-capacity trucks, there are letters and claims on parts and assemblies that are considered sufficiently reliable; they say they worked for a short time. It must be said, that in the office of the chief designer any observation of the user is treated most attentively. We ran across this driver's letter: the cabin door lock jams. It turned out that the mechanism simply had not been cleaned and lubricated in a long time.

To be sure, the Kama workers foresaw that the users would not, technically or psychologically, be immediately ready to use the new vehicle, and that is why they began seven years ago, with the support of Minavtoprom, to set up a system for KamAZ trucks to be serviced by the firm. Right now auto centers in the country number 160. Their personnel must supply spare parts to auto enterprises, give consultations, conduct technical education, etc.

However the auto centers are still having little effect on the longevity of KamAZ trucks. The association regularly sends specialists to large truck fleets to inspect their large-capacity trucks. It must be said that the picture that unfolds before the inspectors is far from bright. One of the designers said this after a routine trip: "We deal with micrometers, and the users deal with a chisel and hammer".

Factory specialists, together with GAI [State Vehicle Inspection], frequently stop KamAZ trucks on the road. Quite often they discover faults. A special oil has been developed for the vehicle, but it is not to be found at filling stations. And drivers have to put all kinds of substitutes in the crankcase.

"We think that maintenance should not only not lag behind the development of production, but should significantly outstrip it," says V. Faustov, general director of the association. "In many cases the vehicle is being operated according to principle--that's all right, it will hold up; it's as strong as iron. Why does the technical availability factor for KamAZ trucks in some fleets reach 0.91, while in others a third of the fleet is idle? It's a matter of the level of maintenance. Sometimes for interest's sake you ask a driver or mechanic to name the most important operations of TO [Service Check] No 1. There are 12 of them in all, and one has to know them like the multiplication tables. And the man will name half of them with difficulty and then falter. If he doesn't remember, it means he doesn't do them. Can a vehicle run long under these conditions? And we're talking not only about vehicles of the KamAZ make; tens of thousands of Kama diesel engines are put in vehicles of the ZIL [Moscow Motor Vehicle Plant imeni I.A. Likhachev] and Ural makes and on buses."

Users have recently begun to demand that Minavtoprom increase the norm for spare parts consumption. It has, in fact, been established for the KamAZ at a lower level in comparison with other diesel trucks. What was this--miscalculation, unfounded optimism?

In Moscow there is the integrated vehicle works No 1, which G. Krauze, Hero of Socialist Labor and a most experienced automobilist, has directed for many years. Two hundred Kama large-capacity trucks are in operation here. And the drivers are fully able to manage with the present quota for spare parts consumption. Why? Because they prepared seriously for the use of the new vehicle. Before the integrated vehicle works was resupplied with KamAZ trucks, specialists went to the plant, studied the features of the truck thoroughly, conducted additional training for the drivers, improved conditions for maintenance, and established control.

And the work is not stopping. Oil facilities have been established for setting up the trucks, a special maintenance shop for KamAZ trucks is being organized, as is a training classroom for improving the qualifications of drivers. And the KamAZ trucks are working perfectly! It turns out that the quantity of spare parts is not the point...

Not long ago the integrated vehicle works, the Kama association, specialists from the TSNII [Central Scientific Research Institute] for Motor Vehicle Building, and the Moscow Vehicle Road Institute have concluded an agreement among themselves that is very important to the further fate of the KamAZ. We are talking about scientific-technical collaboration with a view to increasing the quality, reliability, and effectiveness of the work of the large-capacity vehicles produced in the city of Brezhnev. Without a doubt the joint effort will lead to useful discoveries; but it is clear now that the integrity of the brand will to a great degree depend on the level of use of the vehicles.

We have touched the problem of the quality and effectiveness of Kama large-capacity trucks at the juncture of the elements "design-use". But one point is to develop a prototype with the efforts of the most skillful craftsmen, and the other is to adjust the production of hundreds of thousands of similar vehicles of equal quality, and at minimal cost.

[10 Jul 84 p 2]

[Text] Brezhnev, Tatar ASSR--2. A Sense of the Goal

The Kazan dispatchers were struck. The situation in the power grid had turned out in such a way that it was necessary to limit sharply the supply of electrical energy to KamAZ. Serious complications were expected, especially in the foundry. Stopping the melting process means putting "saw-horses" in the furnace and taking the foundry out of operation for a long time, and with it the whole complex.

The Kama foundry stood its ground. The ASU [Automated Management System] system rescued the "melting". Electronics was able to distribute what little power capacity was left among the furnaces and hold the plant on hunger rations in the most rational regime for the dramatic situation. No one could have carried out such manipulations by hand. You say electronics saved the plant? No, the people saved it who established a flexible system not forseen by the design.

And at the beginning many reacted sceptically to this venture. Old founders even called electronics into a contest. They made up an irreproachable schedule for melting; they followed the process attentively. What happened? On almost every operation the computer, if only by a second, outdid the most experienced founders, and the final result turned out to be indisputable: it is easier for people to work, the meltings proceed faster, and the furnaces last longer. Last year alone ASU allowed a savings of several million kilowatt-hours of electrical energy.

The group of young engineers headed by G. Tereshko, the "chief ideologist" of the system, won tremendous respect at the collective. And it is not easy to gain authority at the foundry. Inventors and rationalizers number 1260 here. A number of operations that are accomplished throughout the world by means of hard physical labor have, through common efforts, been made easier, and in some cases even automated.

Six athletically built men with chopping hammers in their hands used to stand in the section where the rear wheel hub was processed. The work was not only strenuous, but also dangerous because of the vibration. These athletes were retired at age 50. Now there are two operators there, and hammers are completely unnecessary. Last year the labor of 64 people was made easier, and now there are plans to "free up" 84. The success so far is modest, but a struggle is going on for every man; special lines are being fitted, robots are being programmed... In a few years industrial waste has been reduced to almost half as much and manpower turnover by a factor of 1.5.

In the brisk work, talents are rapidly coming to light. And it is not surprising that in the course of work on ASU young engineers, apart from valuable consultations, began to receive tempting offers from various NII [Scientific

Research Institute]. They were promised higher salaries and shown potential for scientific growth. Not one of the group yielded to persuasion. Because KamAZ is the very place to see the boldest technological idea realized. Nobody works "for the shelf" here. Everyone here feels a universal interest in the successful solution of problems.

One evening, toward the end of the second shift, we were touring the pressing-framing plant. It was hard to believe that right here in 1976 they were assembling the cabins of the first KamAZ trucks. The welding was done by hand then on heavy "tongs"--purely men's work. Now eight girl operators weld the cabins on automatons; basically they push buttons.

In the long passage between automated lines we met a bicyclist. A fairly young man with a professorial beard was thoughtfully turning the pedals. Partkom secretary V. Iyovleva glanced at her watch and shook her head. "Valentin Tsitsar', head of the robot laboratory," she nodded after the cyclist. "He's made a pledge; he says he won't shave his beard until he solves the problem". "What problem?" "Oh! For a real engineer, to see a man doing tedious heavy labor side by side with electronics, with automatons..."

The laboratory really is solving complex problems. So the fate of a small collective is not simple. At one time two unique robots were acquired for the factory. They were supposed to buy them, so they bought them, and how these "iron guys" would fit into the technology was only rather dimly imagined.

A group of engineers was brought together. Rather it formed itself from those who were ready to study technological wonders day and night. While the group was studying something the busy season began at KamAZ. A giant factory had to be undone. They reasoned sensibly--this pair of robots won't have a decisive influence, so the group dispensed them individually to KamAZ's busiest points.

But as soon as production began to return to normal, V. Paslov, the director of PRZ [Engine Repair Plant], announced at a meeting that it was time to start thinking about the future, and that it would not be a bad idea to reestablish Tsitsar''s group. The team was immediately at full strength, as if they had been waiting for the signal. But now the program was definite: robotization! The laboratory's plan is measured not by the number of its scientific publications, but by the liberation of numbers of personnel from strenuous and monotonous operations.

The director of PRZ is a typical Kama veteran. Although he is not yet 40 years old, he has gone from ordinary engineer to director of a many thousands strong collective. In this time an accurate computer-based system for accounting and control has been introduced at the plant.

The introduction of ASU proceeded painfully here too, since the system is very meticulous. It does not allow anonymous mistakes; it absolutely requires that the one responsible for waste, malfunction, or idle time be named. If the guilty party is not found, the shop foreman loses a bonus. At first the one whose nerves turned out to be the weakest took the blame. But the computer does not only settle the blame; it also amasses material for analysis, and the truth inevitably comes out.

The system is tough. When it was introduced they counted on improving production indicators, but beside this they obtained a sharp reduction in manpower turnover and disciplinary violations at the plant. All this indicates that people place a high value on a fair assessment of everyone's labor contribution.

In eight years not only the factory has changed, but the people as well. They remember here with what "whining" robots were introduced in the paint shop. There are dozens of them there now, and if even one breaks down the noise raises the roof: "It's impossible to work!"

The improvement process goes on in all the subdivisions and all the services of the complex, sometimes in unintelligible ways. Not only fair winds have filled the sails of KamAZ. They have had to withstand squalls from a contrary, most harmful direction. We are talking about the American "embargo", "sanctions", and other dishonorable actions. At one time KamAZ acquired several thousand units of equipment fitted with imported electronic operating systems. And now the Reagan set has decided to convert the purchased equipment into a trap. It has achieved a cessation of deliveries of spare parts and electronic plates in order to bring the motor vehicle plant to its knees.

And what has been the result? Only that there is a new subdivision in the KamAZ association. It is called the directorate of electronic automation and industrial electronics. KamAZ specialists, in cooperation with Minelektronprom sat down, reached an understanding, and adjusted their production. To be honest, they did not assemble to deal with the output of these electronic plates, microcircuits, and so on. They thought that there would be no purchasing problems. But they have already been obstructed once...

Last year more than 750 thousand rubles was saved on this point. It turns out that the work is interesting and, more important, exceptionally advantageous. At KamAZ now they are making the most delicate things for other plants in the field as well, like "consumer goods". And they are apparently beginning to enjoy it: the volume of production doubles every year, many processes have been automated and put on a production line. In addition, the work has been distinguished; they went to VDNKH [Exhibit of National Economic Achievements] with their wares. It turns out that the Americans have spoiled commerce not only for themselves, but for their partners as well. Can the Kama workers be stopped now?

N. Klyagin, the directorate's chief engineer, is certain, "We can make still more things at our mini-radioplant. We would like only to enlarge our home elementary base. Specifically the home base... Help out in Minelektronprom. That is a gold mine!"

So the time is right to be grateful for "sanctions".

Their own interdepartmental discrepancies, errors in deliveries, and incomplete planning disrupt production much more. And in the first place the incompleteness of construction. The huge association is still lacking an engineering center, a training center, and an administrative center. Obviously in the planning organs they think the most important thing is that the lathes are turning. But management is a no less important component of industry. A training center is

its new personnel. Up to now KamAZ has been staffed basically by newcomers. An engineering center determines the future standard of the plant, tomorrow's vehicle. What will it become? Will engineering thought outstrip the world's best achievements or will we be eating dust trying to catch up to the analogs?

Of course there are objective reasons here too. KamAZ is the first enterprise in the country to take on the heavy burden of maintaining trucks. And instead of concentrating all their efforts on producing the projected 150 thousand trucks per year, they have had to build a special plant for engine repair, a spare parts plant, and develop a service network. But where is the most benefit for our society, in increasing the numbers of KamAZ trucks or in improving their utilization? Is not the most important goal to improve the efficiency of the country's fleets?

In this perfection process the thing that inspires the greatest optimism is the raising of the standards for personnel competency and workmanship at KamAZ. The collective is coming of age; 84 percent of the Kama workers have secondary or higher education. And all these innovations--automatons, robots, ASU, development centers--are perceived by the personnel today not as experiments, but as indespensable and natural elements of modern technology; elements that not only do not minimize the role of man in industry but, on the contrary, enhance it.

We have illuminated only a few moments of the many-sided life of the huge association. The chief conclusion is that the Kama collective has a single concern, a single point of view: tremendous national wealth has been established, powerful industrial potential has been accumulated, and everything must be done to ensure that the complex fully realize its potential.

12461
CSO: 1829/373

CHARACTERISTICS OF NEW KRAZ-260 TRUCK

Moscow AVTOMOBIL'NYY TRANSPORT in Russian No 7, Jul 84 pp 48-50

[Article by V. Tabolin, chief designer; V. Petruk, chief of the design bureau, office of the chief designer; and S. Malov, chief engineer, Kremenchug Truck Plant: "The New All-Wheel Drive KrAZ"]

[Text] The Kremenchug Truck Plant imeni 50th Anniversary of the Soviet Ukraine has been producing three-axle, all-wheel drive trucks for more than a quarter-century. They are widely utilized for hauling various loads under complex road conditions.

Manufacture of three-axle trucks with a 6 x 6 wheel arrangement began at the Kremenchug Truck Plant [KrAZ] in 1959, when the model YaAZ-214, designed at the Yaroslavl' Truck Plant, was sent there for production. The YaAZ-214 had a two-stroke diesel with 205 horsepower, a pneumatic booster for power steering control, 15.00-20 tires without air pressure regulation, and a 12-volt electrical system. In terms of speed, load capacity and dynamic qualities, this truck was as good as the best foreign models of its time.

In 1965, the KrAZ began production of a new model all-wheel drive truck, the KrAZ-255B, with the 240-hp YaMZ-238 four-stroke diesel engine, and wide-track tires with air pressure regulators. The truck had a load capacity of 7.5 tons, a speed of 71 km/hour and improved rough-road performance. Its design included a twin-disk clutch, a new transmission, an improved distributor, and a strengthened front driving axle. The rear suspension was changed, the power steering system was equipped with a hydraulic booster, etc.

While the models produced were being modernized, work was simultaneously in progress for improving the reliability and durability as well as the quality of the trucks being manufactured. Important stages in this direction were the introduction of defect-free manufacturing from the initial production, establishing a set of standards for the enterprise and a permanent quality-control commission, organization of support points, work with scientific-research and branch institutes, and developing and putting into production technological design measures. All of this permitted increasing vehicle service life by 60 per cent, while the technical servicing period was increased by a factor of 1.5. In addition, the norms for use of spare parts declined.

Taking into consideration the positive experience in the operation of the KrAZ-255B models and the ever-increasing demands of the operators for such trucks, the Kremenchug Truck Plant created a new vehicle, the KrAZ-260 (See illustration), which in comparison with the preceding model possesses higher productivity, greater economy and a longer service life.

KrAZ-260

The designers retained the truck's hood configuration, which is more suitable for a vehicle of this class; however, in order to improve visibility, and increase the length of the truck bed, the cab was moved a little closer to the engine. Because of this, the hood of the KrAZ-260 has become more steep and was shortened in comparison with that of the KrAZ-255B truck. The hood arrangement also provides good access to the engine, it divides the engine compartment from the driver's operating position, and it increases the space in the cab. It also makes it simpler to modify the cab for operation in the northern regions.

The KrAZ-260 is the first model of a Soviet all-wheel drive truck on which the engine is equipped with a turbo supercharger. The vehicle is equipped with a four-stroke, eight-cylinder YaMZ-238L diesel engine.

The practice in domestic truck-manufacturing has been to use turbo supercharged engines basically for highway trucks, especially the main highway tractor-trailer rigs which are operated on hard-surface roads. But there has not been a great deal of research on using such an engine on vehicles designed for continuous operation on soft, non-uniform surfaces. Therefore, it was necessary to carry out special tests.

These tests indicated that installing a turbo-supercharged diesel on an all-wheel-drive KrAZ truck noticeably increases its speed over non-uniform surfaces. In traveling through deep snow, as well as over ground with a very moist upper layer, increasing the relative power of the engine by 13.4 per cent by means of the turbo supercharger permits increasing its traveling speed by an average 23 to 24 per cent. On sandy soil, the speed at which the truck can travel increases by 11 to 14 per cent; while on general-purpose roads, depending on the intensity of the traffic flow, speed was increased by 2.5 to 6 per cent (On the test tracks, where there were no obstacles, the increase was from 9 to 18 per cent).

In terms of its design characteristics, the KrAZ-260 truck has advantageous differences over the KrAZ-255B1 truck, which is still being produced. The air intake passes through the forward part of the hood, and is directed to the air-cleaners by means of air ducts. The air which enters the engine is filtered through two air-cleaners which are situated under the hood. Air purification is two-stage: The first stage of purification is inertial; the second, by means of a changeable filtering element, manufactured of special porous cardboard, which has low resistance and a high filtering capability. Air is discharged from the air filters by means of ejection.

The radiator system for cooling the YaMZ-238L engine is of the tubular-strip type, with increased heat transference. It is equipped with a larger tank for coolant recovery when antifreeze is used in the cooling system. In order to improve the heat conditions for the engine when the truck is operated under high temperatures and in desert areas, the designers employed packing on the sides of the radiator. In order to make it easier to start the engine in low temperatures, they designed an efficient pre-start heater and a device of the "termostart" variety.

A dual-disk clutch with a pneumo-hydraulic booster was installed on the KrAZ-260 truck. The YaMZ-238B transmission is a mechanical, dual range type with eight gears, with synchromesh at each gear. The range limit of the transmission is 10:88, while the difference between adjacent stages is 1:4. This allows the driver to effectively utilize the power of the engine under a variety of road conditions.

The KrAZ-260 truck is equipped with a mechanical, two-stage distributor box with a differential which transmits the torque from the engine to the front driving axle and to the winch. The first, the highest stage, with a gear ratio of 1:013, is intended for picking up speed. The second, lower stage (with a gear ratio of 1:31) is selected when operating the vehicle under severe road conditions. The distributor box was built with a unified gear housing and has three output flanges for driving the front driving axle, the rear axles and the winch.

In order to evaluate the reliability of the new all-wheel drive truck, tests were conducted at the plant to evaluate the load capacity of the transmission, fuel consumption, and wear of tires. The tests showed that for a truck with a 6 x 6 wheel arrangement and wide-track tires it is most sensible to utilize a front rear axle with positive interlocking of the differentials of the axles of the rear bogie and the differential for the continuously-operating drive gear of the front axle.

Employed in the distributor box is an asymmetrical differential, which distributes the torque between the front axle and the rear bogie at a ratio of 1:2. When the vehicle is driven under difficult highway conditions (slippery roads, glare ice, cracks in the paving) the driver can block the differential.

Lubrication of the gears, bushings and bearings of the distributor box is combined. The friction surfaces of the gear bushings of the upper and lower transmissions of the main shaft are oiled by means of an oil pump with an oil line running through the central aperture of the main shaft. The remaining gears and friction surfaces are lubricated by spraying. In comparison with the KrAZ-255B truck, the weight of the new distributor box has been reduced by 60 kg, and its service life increased by 30 per cent.

The designers have devoted a great deal of attention to perfecting the drive shaft and universal joint, and increasing their quality--which means their reliability as well. For the bearings of the drive shaft on the KrAZ-260, which operates as an off-the-road vehicle, they have developed dual-rimmed radial end facings and seals with a flow-through lubrication system. Operating tests of the bearings on the drive shaft gears equipped with the new seals have shown that the durability of the ball bearings increases by a factor of 2.5 to 3, and use of No 158 lubricant permits increasing the intervals for replacing them under operating conditions. The design of the seals for the torsion links on the drive shafts has been changed. The torsion links have been hermetically sealed and a telescoping protective housing is provided for the seals.

Increasing the overall mass of the KrAZ-260 truck and standardizing its basic components with those of new-model KrAZ trucks, which have a 6 x 4 wheel arrangement and high axle load capacity reaching 13,000 kg, was demanded of the designers developing new front axles. The plant and NAMI [Red Banner of Labor Automobile and Automobile Engine Institute] have developed straight-through front axles for the KrAZ-260 and its modifications, taking into consideration the technological continuity and experience in refining serially-produced axles, established for the KrAZ-255B trucks.

The front axles have a dual primary transmission with beveled gears and cylindrical gears with angled teeth. All of its parts are contained in a single gear housing. The gear ratio of the primary transmission is 8:17. It was chosen in consideration of the actual operating speed of the vehicle.

The wheel differential can be blocked. Blocking is accomplished by means of connecting the clutch gears of the semi-axle and the differential pans. A special feature of the design of the reducer is its press-fitted assembly with the front beveled gear on the drive shaft.

Working out the design of new front axles and the separate elements was carried out in two stages. Initially we conducted bench tests and then tests on the road. The results of the bench tests showed that the new reducer operates for a significantly greater length of time before breaking down than for that of the KrAZ-255B (they were tested under identical conditions). The teeth of the beveled gears and the cylindrical pairs were

greatly simplified by virtue of changing the module of the teeth from 10.5 to 11.0 mm and from 6.25 to 7 mm correspondingly. Apart from this, the meshing angle was increased from 17.5 to 25 degrees. The designers made the rim of the gear teeth of the cylindrical pairs wider, and they changed the design for meshing of the teeth from straight to angled.

Technical Characteristics of the KrAZ-260

Load Capacity, kg	9,000
Gross Weight, loaded, kg	12,775
Weight of a towed trailer, kg	
for all types of road	10,000
for roads with improved surface	30,000
Maximum speed, km/hour	80
Length, mm	9,030
Width, mm	2,720
Height of cab, mm	2,985
Loaded height of the truck bed, mm	1,560
Base (from the front axle to the middle axle, mm)	4,600
Wheel track, mm	2,160
Road clearance, mm	370

Bench testing of the new crankcases showed that their static strength increased by a factor of 1.1 to 1.5 before breaking down, as compared with those of the KrAZ-255 truck, while their rigidity increased by a factor of 1.2-1.9. The new axles were tested on the road over a distance of 250,000 km. The test results confirmed the effectiveness of the design improvements to the rear driving axles.

The front driving axle of the KrAZ-260 truck has been put together in the same way as that of the front axle of the KrAZ-255B truck. The gears on its reducer have been combined with the reduction gears on the rear axle. The universal joint was improved for equal angular velocities. We changed the diameter of the disk from 108 to 120 mm, and increased the supporting surface of the bushings of the semiaxles in terms of the end facing and the diameter. Strengthening the ball support was increased owing to the use of a larger diameter pin--22 instead of 18 mm. And we managed to reduce the weight of the axle by 37 kg.

In current operating conditions the frame of a freight truck must have a reserve equal to its term of service. We solved this task in a coordinated manner, using high-strength steel and improving the design of the frame.

Joint research conducted by the Kremenchug Truck Plant, NAMI and the MVTU [Moscow Higher Technical School] imeni N.E. Bauman, showed that in order to increase the reserves of the side members and the crosspieces, one must reduce the pressure from flexing of the vertical and horizontal surfaces in the middle part of the side members, remove all holes from the platform, move the places for fastening the basic and the auxiliary units, and improve the design of the crosspieces and the places at which they are connected with the side members.

The composite design of the frames for KrAZ-260 and KrAZ-250 trucks is one of the spar and ladder type. It is more useful for heavy trucks. The spars are made of No ZOV-1 hot-rolled channel iron made from 15KhSND steel. The point of resistance of the spars has been increased owing to thickening the vertical walls from 7.5 (KrAZ-255B1) to 9.5 mm. The spars and the crosspieces are bolted together. The crosspieces are made of 09G2 low-alloy steel.

The front and rear balanced suspension of the KrAZ-260 truck rests on semi-elliptical leaf springs. They are the same as those on the KrAZ-255B1 truck, but they have certain design changes brought about by increasing the loading on the suspension and by the need for increasing their service life. These changes consist of additional bolted support brackets on the balancer and the vertical flange of the spars of the frame, improved design of the joints on the reaction bars and their packing, and so on. In order to improve the rough road performance of the vehicle, especially for pulling out of deep ruts, model VID-201 tires have been installed on the KrAZ-260; these tires have certain changes in the profile of the tread on the edges of the tire. Tire pressure is is regulated according to the road conditions.

The steering control on the KrAZ-260 has a hydraulic booster. Special features of the steering controls include use of the MAZ-5336 unified steering mechanism and installation of a power cylinder right on the truck's front axle. This steering control system permitted eliminating the load on the leaf spring support which arises from stress in the steering gear, eliminating the influence of movement of the front supports on the hydraulic booster, and improving the stability of the steering wheels.

The vehicle is equipped with a service brake system which which operates on all wheels; a parking (backup) brake system, which operates on the wheels of the rear and intermediate axles; and an auxiliary power brake system which is installed in the exhaust gas system. The service brakes are of the drum-shoe variety. The internal diameter of the brake drums of the front and rear wheels is 420 mm; the width of the front brake shoe lining is 120 mm and that of the rear is 180 mm.

The parking (backup) brake system is operated with the aid of a valve with manual control, which is installed in the driver's cab. The front brake chambers are the MAZ-500 diaphragm type, while the rear are pneumatic-spring type, which perform in addition to service braking, the function of parking and emergency brakes by virtue of the potential energy of the already compressed springs.

In order to increase the safety of the vehicle, the brake control linkages are separate; one brake contour operates the brakes on the wheels of the front and the intermediate axles, the second the brakes on the wheels of the rear axle. The pneumatic system is combined. It permits operating the trailer brakes by means of a one or two-line system.

The electrical equipment on the KrAZ-260 truck operates on a single-wire system, with 24 volts direct current. There is also a 1 kWt AC generator with built-in rectifyers. The power of the starter is 7 kWt. Two storage

batteries are installed in insulated containers. There is an electric horn and a two-tone air horn. In addition to the two headlights, the truck is equipped with two foglights and a spotlight.

The cab of the KrAZ-260 is all-metal, and has space for three people. The driver's seat is spring-mounted with a hydraulic shock absorber. The position of the seat cushions can be adjusted for length and height. The angle of the backrest can also be adjusted. The cab is equipped with a heater; with blowers for the front and side windows; with a fan, lighting and a convertible sleeping space. The cab, as well as the body accessories, are supported at four points; moreover, the front support is equipped with two hydraulic shock absorbers.

The body accessories of the KrAZ-260 cab have a new architectural contour. In terms of its body accessories, the KrAZ-260 differs from the KrAZ-250 only in that the fenders are a bit wider to accommodate the arch of the wheels. This was done in order that the side windows of the cab do not become covered with mud; after all, the KrAZ-260 is equipped with wide-track tires.

The cargo bed of the KrAZ-260 is made of metal and has a hinged tailgate. It can be equipped with additional latticed sides and with a canvas. The cargo bed has been equipped with a winch. The operating length of the cable is 53 meters, and the tractive power is 120 kN (12 ton-force). The winch cable can be paid out both in a forward and backward fashion.

The KrAZ-260 has undergone thorough testing in the various climatic zones of the country--in the mid-sector, in the hot desert areas, and in the high mountains--and has proven to be a reliable vehicle. Today the KrAZ-260 is in serial production. Other vehicles being produced on the same design base are the KrAZ-260G, whose chassis has a longer wheelbase; and the KrAZ-260B, a truck tractor.

9006
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FEATURES OF NEW KAZ-4540 DIESEL DUMP TRUCK TRAIN

Moscow SEL'SKAYA ZHIZN' in Russian 22 Apr 84 p 4

[Article by SEL'SKAYA ZHIZN' special correspondent B. Konstantinov: "Truck Train From the Banks of the Rioni"]

> [Excerpts] Kutaissi-Moscow --At the Kutaissi motor vehicle plant series production of a diesel dump truck train, designed for work in agriculture, has been begun. This product of Georgian motor vehicle builders, designers, and engineers from NAMI [Science and Research Automotive and Auto Engine Institute], the Avtodizel' Production Association, and the Balashovskiy Main Design Bureau for Motor and Tractor Trailers got their start this spring.

This vehicle is made for the village, and operating conditions there are much more complicated. For example, safety in traveling over wet ground. The new KAZ has 4-wheel drive. Hydraulic drive ensures the precision following of the trailer; the trailer's mechanisms precisely carry out the commands received from the control panel in the cab.

But the list of technological innovations used in the design of the 1984 KAZ-4540 does not end here. Built on the instructions of the union ministries of agriculture, ministries of the motor vehicle industry and USSR Goskomsel'khoztekhnika, this auto tractor trailer dump truck should satisfy the highest modern demands made on motor vehicle technology.

The new cab with hydraulic hoist is comfortable for the driver to work in under any weather conditions. Steering is made easier since its automatic. The powerful 160 horsepower engine with a fixed ratio 8 transmission, allows the truck to take on a load of 11 tons and travel fully-loaded at a speed of up to 80 kilometers per hour.

The design of the extended sides on the tractor and the trailer is unique. Just like the basic ones, they open automatically on both sides, and as the platform is inclined the load pours off evenly. The first shipments at the height of the last cabbage and corn harvests showed how effective such a method

of unloading is. Here we will note that with extended sides a truck can, in one trip, deliver a volume of produce up to 14 cubic meters, which is twice as much as can be delivered in truck bodies of the usual design with the same motor capacity.

Back at the plant, in the assembly-inspection block I get acquainted with the shop foreman, Leo Gvatadze. This experienced production worker came here not long ago; he agreed to leave his responsibility as shop foreman on the main conveyor where vehicles of the usual Kutaissi models are produced.

"It was as if a magnet was pulling me toward the new vehicle," Leo explains his decision. "And although the conditions for assembly at the new site are hampered for the time being, our whole collective lives by the dream of starting up the main conveyor for the 4540 model. And this will be soon. Already the first dozens of rigs have been turned over to the republic's Goskomsel'khoztekhnika and are being used on the sovkhozes and kolkhozes of the republic. We have established a technical headquarters to organize production and check the quality of assemblies and mechanisms of design; leading specialists from NAMI, Moscow Scientific Research Institute for Auto-instruments, and other scientific and industrial organizations of the USSR Minavtoprom are now on staff here. In a word, one can say that the rural KAZ is being built by the entire country."

It was here that I talked with Ministry of Motor Vehicle Industry worker S.M. Korneyev. Sergey Mikhaylovich described the enthusiasm of the Georgian vehicle builders as follows:

"No words are adequate, they're great guys! They are outstripping the fulfillment of the preliminary plan. And this on a machine as complex as the new KAZ. I am sure that by the time the conveyor is ready the plant will have a qualified collective of assemblers."

And, finally, the last interview. This time with the general director of the Kutaissi Motor Vehicle Plant Production Association, T.L. Gendekhadze.

"How can the start of series production of the trucks prior to start-up of the main conveyor be explained," I ask Tengiz Levanovich.

"First of all by the urgent need of the village for a special vehicle. Now it is already possible to talk about the second birth of the plant, which has become a major site not only in the republic, but in the country. Before the end of the five-year plan 20,000 automatic dump trailer rigs will begin coming off the conveyor. They are impatiently awaited by grain growers, stock breeders, and farms that grow vegetables and fruit or gather cotton and flax."

The April sun in Kolkhida is blinding. You involuntarily screen your eyes with your palm. But the local inhabitants regard it calmly, as, for example, does the young worker Gocha Kuprashvili. Right in the blazing sun he is marking the KAZs that have just rolled out from the cool shop. A short time ago Gocha traced out the first 10 numbers of the new vehicles with chalk on the chassis. And today, holding his face up to the hot rays, he is already tracing out three-digit numbers on the black metal.

Have a good trip, rural KAZ!

12461
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BRIEFS

MODIFIED VOLGA AUTO PRODUCED--(TASS)--Preparation and production of the passenger car Volga GAZ-24-10 has begun in Gorky. This car will appear on the country's roads as soon as the end of this year. From the GAZ-24 it took the comfortable practical body, and from the GAZ-3102 the modern interior, separate brake system with vacuum amplifier, and low-profile radial tires. The Transvolga auto builders modernized an engine with spark ignition for it. The GAZ-24-10 is not a simple composite of the parts that make it up. In order to put the instruments, seats, and panels of the GAZ-3102 in the body of the "24," the car enterprise must use more than 100 new body parts. [Text] [Moscow LENINSKOYE ZNAMYA in Russian 13 May 84 p 4] 12461

ZHITOMIR DIESEL EQUIPMENT FACILITY--Zhitomir--The first stone has been laid in the foundation of the largest technological complex for the production of fuel equipment for the diesel motors built in Zhitomir. The Polessnyy ZIL advanced post will supply the country with highly effective motors designed for the new economical ZIL-169 diesel automobiles. Thanks to this it will be possible to save nearly a million tons of fuel annually in the country, and the use of high-tonnage tractor trailers will make it possible to free up almost 40,000 drivers in the national economy. Taking into consideration its exceptional importance, the ZIL union plant for the production of combustion engines, located in Zhitomir, has been declared an urgent republic Komsomol effort. Its first phase should go into operation in 1988. [By G. Mokritskiy] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 25 May 84 p 2] 12461

INCREASED PRODUCTION OF VOLYNYANKA'S--Lutsk (RATAU)--This automobile stands out advantageously among the others of its class. Its small dimensions, comfort, and high capability distinguish the LuAZ-969M from many similar domestic and foreign models. For this reason one can see the Volynyanka (as the popular all-terrain vehicle is called) in the Far North and the Far East. It is capable of handling the barakhans of Central Asia and the difficult roads of the Non-chernozem areas. Carrying out the decision of the 26th Party Congress and subsequent plenums of the CPSU Central Committee, Lutsk automobile builders are raising the quality, reliability, and durability of their product. This year they decided to achieve an increase in labor productivity of 1 percent over the plan and an additional reduction in the production cost by 0.5 percent. This will be made possible by putting into operation the new automatic and semi-automatic equipment and industrial robots, the introduction of progressive

technology, and a decrease in the number of workers doing hand labor. About 12,000 vehicles are now produced at the automobile plant every year. With the completion of reconstruction, which is presently at its peak, the production of Volynyanka's will increase more than four-fold. [Text] [Kiev RABOCHAYA GAZETA in Russian 29 May 84 p 3) 12461

BRIDGE COMPLETED IN CAUCASUS--Ordzhonikidze (TASS)--Transport traffic began running over the new bridge raised by builders on the northern sector of the Caucasus Pass Highway. In the difficult conditions of high mountains, the bridge builders of North Osetia put this last crossing on the route into operation exactly on schedule. For the first time in the practice of building alpine crossings in the Caucasus, all the bridges have been assembled from pre-stressed reinforced concrete structures. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 3 Jun 84 p 1] 12461

BRIDGE OVER LENA RIVER--Ust-Kut--Assembly has begun on the second riverbed support of the new motor vehicle bridge being built across the Lena River in the Ust-Kut region. It will be 400 meters long and more than 10 meters wide. The bridge height is calculated so as not to interfere with ship traffic, rising almost 30 meters over the Siberian river. The new bridge will connect the fleet's Osetrovskiy maintenance and service base, situated on the right bank, with Ust-Kuk and the Osetrovskiy port. The Mostostroy-9 Trust Collective has pledged to raise all the supports and mount the first span this year. [Text] [Moscow VODNYY TRANSPORT in Russian 7 Jun 84 p 4] 12461

NEW BRIDGE ACROSS YENISEY--Traffic has begun to move on a new motor vehicle bridge across the Yenisey. The overall length of the bridge is more than four km. There are six lanes for motor vehicle traffic as well as streetcar tracks on its right of way, which is 41.6 meters wide. The collective of the Yenisey steamship line took an active role in the construction of the bridge over this Siberian river. [Text] [Moscow VODNYY TRANSPORT in Russian 18 Aug 84 p 1] 9006

CSO: 1829/415

MARITIME AND RIVER FLEETS

CHIEF ON WORK OF UKRAINIAN RIVER FLEET ADMINISTRATION

Kiev POD ZNAMENEM LENINIZMA in Russian No 10, May 84 pp 40-42

[Article by N. Slavov, head of the chief directorate of the river fleet under the Ukrainian SSR Council of Ministers: "At a Decisive Stage in the Five-Year Plan"]

[Excerpt] One and a half years remain until the end of the 11th five-year plan. Therefore it is no coincidence that we are more and more often verifying the results of our work with the check digits for the five-year plan. After all, for the Soviet people there is no more responsible task than the complete fulfillment by every branch, every enterprise, and every worker of the decisions of the 26th CPSU Congress pertaining to the further economic development of our country.

The collectives of the Ukraine river fleet are laboring strenuously on the fulfillment of the quotas of the 11th five-year plan. The results of the work over the last three years show that the targets and commitments have basically been met. During the last period 162 million tons of freight was transported and the freight turnover reached 34.2 billion ton-kilometers. The targets of the five-year plan, according to these indices, were fulfilled 101.8 percent and 100.9 percent respectively; 3.2 million tons of national economic cargo was transported in excess of the plan and additional freight turnover comprised 690 million ton-kilometers. It should be noted here that the shipping and freight turnover quota has been fulfilled in terms of both the sum of yearly plans and the approved check digits.

The volumes of industrial freight deliveries have increased significantly. Shipments of iron ore products increased by 90 percent, metals by 49, grain by 29.5, and freight in containers by 15.2 percent.

Shipments by combined river-sea transport have begun to occupy a special place in the work of the river fleet. The volume of shipments abroad increased by 67.5 percent over the last 3 years, and freight turnover by 98.1 percent.

The amiable harmony of the work of the seamen in the Black Sea, Soviet Danube, and Azov lines and the river transport workers of the Ukraine provides for the most expedient distribution of freight traffic between cooperating enterprises, and for the use of river port resources for unloading marine tonnage during busy periods.

In many respects the successful fulfillment of the five-year plan's freight shipping quotas was favored by the long hard work of the river ports. They fulfilled the loading-unloading quotas of three years of the five-year plan 101.5 percent. In this, 260 million tons of freight, including 3.7 million tons over the plan, was processed in the ports. The further development of the working experience of the cooperating enterprises of the Leningrad transport group, approved by the CPSU Central Committee, allowed the fleet's processing norms to be decreased by 12.2 percent in 1983, and railroad cars by 9.6 percent.

Passenger transports occupy an important place in the work of river transport. In the years of the 11th five-year plan the republic's river fleet was reinforced with 33 new passenger motor ships, terminals were built in Nikolayev and Chernigov, the construction on a terminal in Kremenchug is being completed, and one has been begun in Dniepropetrovsk. A big job has been carried out in the construction of passenger moorages in Kiev, Cherkassy, and other cities. All this has allowed passenger transport to be significantly increased and improved.

In 3 years, more than 80 million people were transported, 7 million in excess of the plan. On separate inter-city lines river transport successfully competes with other types of transport in terms of rate of passenger delivery. Every other inhabitant of the Ukraine avails himself of the services of the river fleet every year, and much is done so that all are left with pleasant memories of the trip along the Dnieper.

This year a regular cruise line, which will be served by the comfortable motor ship the Akademik Glushkov, will begin to function between Kiev, Odessa, and the Danube ports of Bulgaria and Rumania. We hope that this line will be very popular among Soviet and foreign tourists.

Thanks to the constant concern of the party and the government, the material-technical base of river transport has been further developed. In 3 years the plan for assimilating state capital investments has been 103.6 percent fulfilled, and that for implementing basic funds 105 percent fulfilled. As a result, the basic funds of the branch have increased 18 percent over this period.

The successes that have been attained were made possible thanks to the introduction of the achievements of scientific and technological progress into the branch. Realization of the quotas of the scientific-technical program, plans for development and introduction of new equipment, inventions and rationalization propositions as well as scientific-research, experimental-design, and normative operations provided an economic effect in the amount of 12.4 million rubles in 3 years of the five-year plan.

According to the republic scientific-technical program, the planning-design bureau and the Kiev ship building and repair works designed a dry freight motor ship on the D-080M plan. Its operation on the Dnieper-Danube line has indicated good seagoing qualities and technical-economic data. The labor productivity of the crew, in comparison with that achieved on other vessels, grew by 40 percent.

As a result of introducing the leading technology into ports, the level of complex mechanization of loading and unloading operations reached 99.3 percent. Manual

labor is being reduced, and at the branch's industrial fleet repair and shipbuilding enterprises its mechanization is increasing.

The improvement of technology and labor organization permitted the establishment of conditions for the successful fulfillment of five-year plan quotas for labor productivity in shipments, construction, and industry; in industry the entire growth of production was achieved owing to the increase in this indicator. The profit plan was 112 percent fulfilled. In this it comprised a sum of 118 million rubles. The cost of shipping and industrial production was lowered.

A great deal of attention is being devoted to the realization of plans for the social development of collectives. Every fourth worker in the river fleet today has higher or secondary special education. They are ensured good medical and preventive care, and the needs for children's pre-school institutions are basically satisfied. Every year hundreds of families of river transport workers get new housing. Much is being done toward the development of physical culture and sports.

Appearing at a meeting with the electors of the Kuybyshev electoral district, city of Moscow, comrade K.U. Chernenko, CPSU general secretary, said, "We have succeeded in improving economic indicators so far basically owing to reserves at hand, on the surface. We have undertaken to strengthen order, organization, and discipline. And this immediately produced a noticeable economic effect.

"We must proceed further, toward profound qualitative changes in the national economy".

Evaluating the results of all our work from positions of great exactingness, we are unable not to see serious deficiencies in it, as well as unused potential. We will take an important question like the labor productivity of the fleet. In 1983 the quota for the total productivity of the dry freight fleet was 99.9 percent fulfilled; in this the productivity of the self-propelled fleet comprised 98.3 percent in all.

In spite of the fact that in 1983 the average norm for processing tonnage in the ports was reduced, 22.4 percent of the vessels undergoing loading and unloading stayed in port over the norm. The dressing of vessels after unloading is still unsatisfactorily organized in the ports, and the fleet stood idle because of breakdowns in cargo transfer equipment and deficiencies in the organization of traffic. Losses due to untimely repairs on the fleet at our industrial enterprises also have a place. Often the fleet turns into floating warehouses, as the railroad's plan for moving freight out of the ports goes unfulfilled. Just in 1983, the ports received fewer than 10,500 cars.

This has led to only 82.2 percent of ships' crews managing to fulfill state plans.

We see the greatest potential for increasing the effectiveness of work in the unconditional fulfillment of state plans by all collectives. Today no one has a right to plead any reason at all; it is the obligation of each to systematically guarantee the fulfillment of the state plan.

Ensuring the unconditional fulfillment of the plan for transport fleet utilization is stipulated in the organizational-technical measures drawn up for 1984.

Deficiencies in the organization of passenger transports also are a factor. Equitable censures of the workers give rise to failures in schedules of ship movements for meteorological and technical reasons and to deficiencies in passenger service at terminals and on vessels. At the present time measures are being realized for the instatement of order in this important matter. However, such problems as the replacement of obsolete and worn out passenger craft are so far being resolved slowly.

Today the further improvement of passenger service and guaranteeing safe passage are at the center of our attention.

Not everything is satisfactory with the fulfillment of the plan for industrial production either, which constituted 99 percent in all. In the three years of the five-year plan the construction of several vessels fell through, and the fleet's medium repair schedule is not being met. The shift utilization factor for equipment in the basin's enterprises is a little higher than one. Other deficiencies are also factors.

Workers at Glavrechflot's industrial enterprises understand that the potential for developing river transport depends precisely on the improvement of repairs and construction in the fleet, and they are giving it immediate attention.

12461
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LASER NAVIGATING BEACON TESTED AT KUYBYSHEV PORT

Moscow NEDELYA in Russian No 25, 18-24 Jun 84 p 4

[Article by Yuriy Iz'yatskiy in the column "Trials": "Laser Beacon"]

[Text] Kuybyshevites taking an evening stroll along the Volga riverfront by the river passenger terminal became witnesses to an unusual sight. Three thin red beams suddenly pierced the darkness. The picture was fantastic, but its explanation the most down-to-earth: That is how the "Glissada" ["Glide Path"] system of laser ship guidance, originated by a group of Kuybyshev designers, looks in action.

The system proved itself in aviation, for aircraft orientation in landing. It is patented in England, the United States, France and the Federal Republic of Germany, and it was demonstrated in the air-passenger lounge at Le Bourget and at the Leipzig Fair. And now "Glissada" is mastering a new element--water. The first trials in ship guidance were conducted on the Neva. The Volga became the next "proving ground".

"There are more than enough difficulties in guiding ships along such a river as the Volga," says G. Vzyatkov, chief of navigation safety for the "Volgotanker" Steamship Agency. "Take, for example, the lights of a large city. They're attractive for tourists, but an all-around mess for captains, range lights merging entirely with those of the city at times. It is necessary to handle a ship carefully, reducing speed. But you won't confuse a laser beam with anything else."

Our conversation takes place aboard motor ship "MO-108", registered to Kuybyshev Port. On board, a group of "Volgotanker" and Volga Basin Navigational Inspection workers, along with the system's originators, are heading straight for the place of the event. The course--toward a point on the horizon from which the beams emanate.

All eyes were glued on three ruby-colored lines. A central beam shot straight upward at a 90 degree elevation, and two others were symmetrically disposed on the sides. Verticality of the main beam is evidence that the ship is proceeding exactly on course, as if being drawn toward the laser vortex.

Mechanic Ye. Pyatov, he is a substitute captain, turns the helm slightly to the right. The beam responds immediately, having noticeably inclined to the perpendicular. It is hard to avoid the impression that the beam somehow is following the ship. However, the laser beacon is stationary: It is we, who have gotten off course.

"Now that's perceptibility!" exclaims our helmsman. "I've been steering ships for 20 years, and I've never come across such ease of orientation. With this, you won't get lost, even if you want to."

And it's true. We proceed with utmost accuracy: The beam literally has pierced the black dome of sky over the forest ahead of us. It is characteristic of the new system: The poorer the visibility, the brighter the beams. In fog, the beacon is more visible than in normal weather--yet another advantage over ordinary range lights. There are others. For example, lateral beams indicating the fairway can guide ships over the extensive straight-line expanses of water reservoirs where ranges cannot be seen. The system of laser guidance can be used for passage through locks and under bridges. After the Leningrad trials, economists calculated that the use of laser beam beacons on the Neva would permit an annual saving of more than 660,000 rubles, due to expedited ship passage and, consequently, increased cargo turnover. For the Volga, along which millions of tons of cargo are transported, the gain assuredly will be even greater.

Night has fallen. The beams of the lasers are distinctly visible in the gloom. A command is heard on the portable radio set, and the beams go out. The experiment has ended.

...River transport workers observed the installation in operation on three nights. The tanker "Volgoneft' 129" became the first voyaging ship which transited a sector of the river by laser beacon. Her crew's impression was most favorable.

12319
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MARITIME AND RIVER FLEETS

SFRY SHIPBUILDING YARDS FILLING DIVERSE SOVIET ORDERS

Moscow PRAVDA in Russian 19 May 84 p 4

[Article from Belgrade by PRAVDA special correspondents L. Zhmyrev and V. Sharov: "In Danube Shipyards"]

> [Text] Yugoslavia's shipbuilders will deliver to the USSR, during the current five-year plan, about 100 ships of various types--passenger ships, ships of the technical [logistic] fleet, oceangoing tankers and ferries. Their overall value will be about one billion dollars. The large-scale collaboration of the two countries' shipbuilders continues to develop.

...The first large landing on SFRY territory that a Danube River worker encounters enroute to the Black Sea is Apatin. Here, on the left bank of the river, the buildings and quay walls of a large shipyard are located.

Showing us around the facilities, Bosil'ko Orlich, the enterprise's director, noted that recently completed reconstruction had placed the yard among the leading yards in the country. Modern equipment is installed. Before our eyes at the mooring, a dry-cargo ship almost 100 meters long, having arrived for repair, was lifted out of the water in 15 minutes by means of a system of hoists, the synchronous operation of which was controlled by electronics.

"We do the assembling of new ships by a progressive method--by sections," continued B. Orlich.

The flashes of electric welding danced on the ways. Through a maze of scaffolding and superstructures were seen the hulls of four towing vessels for repositioning floating drilling rigs at sea (USSR oilmen already await them) and a catamaran for transporting truck trailers--It is destined for Bulgaria.

Its physical plant and experience, as the director sees it, will permit the collective to take an active part in filling a large new order from the Soviet Union--Construction of refrigerator ships for transporting fruits and vegetables along the Volga or, more simply speaking, vegetable carriers. In February of this year, the keel was laid here for the first such refrigerator ship.

Talk turned on the vegetable carriers at every place there was occasion to visit--at the shipyards imeni I. Broz Tito in Belgrade and "Begey" in Zrenjanin, and at the directorate of the "Dunavbrod" association of river shipyards.

"Production of the motor ship vegetable carriers opens a new page in the collaboration of Yugoslavian and Soviet shipbuilders," declared V. Martinovich, general director of the "Dunavbrod" association on our meeting him. "For our collectives, this is a sort of final examination for graduation."

Clarifying his concept, V. Martinovich informed us that vegetable carriers are a new product for Yugoslavian shipyards. Moreover, the time periods are being rushed. Soviet river transport workers, solving problems associated with realization of the food program, are concerned with obtaining more rapidly the dry-cargo ships which will ensure delivery of perishable agricultural produce from southern regions of the country over thousands of kilometers to Moscow, Leningrad and other industrial centers. The first 20 vegetable carriers will be delivered to the USSR in 1985-1986.

The design bureau of the shipyard imeni I. Broz Tito in Belgrade took upon itself the task of planning the motor ships and preparing the technical documentation. We visited the enterprise.

"We have been building ships for the USSR for over 15 years now," said Deputy Director of the Yard Atanas Omchikus. "We have delivered more than 30 tugs and dredges."

A rather small display in the administration building gave a presentation of the progress made by the enterprise and the development of relations with its Soviet partners. Over the years, ships coming off the local ways have become more complex and more improved.

"All of them were built according to our own plans," continued A. Omchikus. "The accumulated experience is a guarantee that we also will accomplish the new tasks successfully."

The USSR fleet will be augmented with high-class ships. In turn, the large series orders of the Soviet Union are the basis for stable development of the industry. Time and again we heard, from people with whom we talked, that because of such orders, Yugoslavian shipyards escaped serious consequences of the crisis which seized world shipbuilding in the last decade.

They know the products of Soviet plants well in the SFRY. Shipyards filling Soviet orders receive from the USSR radio navigation equipment, separators for cleaning fuel and oil, diesel generators and many other fitting out articles. Along the Danube, and also along the Adriatic seacoast, "fly" our "Comets", "Sunrises", "Meteors" and "Rockets" on underwater wings [hydrofoils], transporting tourists. Dry-cargo ships made in the USSR reliably operate under the Yugoslavian Flag in maritime and river lines.

Exchange of experience and information takes place between labor collectives and planning and design organizations. In recent months, for example, practical working-level contacts were instituted between the Belgrade shipyard design bureau and the Leningrad Central Engineering and Design Bureau of the RSFSR Ministry of the River Fleet.

"How successfully are the Yugoslavian shipbuilders coping with the Soviet orders?" We directed this question to USSR Deputy Minister of Foreign Trade V. N. Sushkov.

"On the whole, the filling of orders for the current five-year plan is proceeding successfully," he said. "There are no complaints about quality. Yugoslavian shipbuilders are familiar with the most advanced technology, but they do have difficulties. The point is, they obtain part of the fitting out articles from West European countries."

Another meeting in Moscow, after visiting the Yugoslavian shipyards, took place at the USSR Ministry of the Maritime Fleet. Deputy Minister B. A. Yunitsyn told us that ships built in the SFRY are operating successfully in ports of registry in practically all basins of the USSR. Take, let us say, the harbor tugs. The need for them arose with the growth of a large-tonnage fleet. They position oceangoing ships, that is, they move such ships from place to place in the water areas of ports. Opinions of the tugs are good; and the last series of harbor tugs is provided with powerful fire fighting equipment, by means of which fire can be extinguished even on high-sided tankers and gas carriers. Floating docks and oceangoing suction dredges built in the SFRY received just such a good evaluation from seamen....

Soviet-Yugoslavian consultations on collaboration in the field of shipbuilding during the coming five-year plan recently took place. The volumes of reciprocal deliveries and ship repair and modernization are being specified. Joint scientific and technical inquiry is proceeding in several directions: Improving the designing of ships and the technology of their construction, and developing shipboard equipment with improved characteristics and future technological equipment standards for plants of the industry.

The cooperation of shipbuilders of the two countries goes far beyond the framework of ordinary commercial relations, and results in mutual benefit.

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LENINGRAD FLOOD CONTROL REQUIRES VESSEL TRAFFIC CHANGES

Moscow VODNYY TRANSPORT in Russian 21 Jun 84 p 4

[Article by V. Volkov, captain's senior assistant (chief mate) of Baltic Steamship Company motor ship "Uil'yam Foster": "The Neva Outlet and Navigation"]

> [Text] Five years ago, the CPSU Central Committee and the USSR Council of Ministers adopted a resolution "On the construction of installations to protect the city of Leningrad from flooding." The system is planned for completion at the end of the 12th Five-Year Plan, in 1990.
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> The construction of a dike, naturally, will bring about changes in navigational procedures and the traffic control system, both in the approach fairways to its Northern and Southern Passes and in all navigational channels of the Neva outlet, at the very mouth of the river and in the port water areas.

Leningrad is the largest Soviet port on the Baltic. From year to year, the number of oceangoing ship visits to its wharves grows, and the transit of river ships increases. According to statistics, these occur during the summer at 1.5-2 minute intervals in the Leningrad maritime channel. There is a correlation between the relationship of navigational passage width to vessel width and the number of accidents. For the Southern Passes the correlation factor is 0.82, which points out the significance of this relationship. Therefore, upon the completion of dike construction, vessel passage speed through the Northern and Southern Passes will be reduced.

Aggravation of vessel traffic coordination problems in the approaches to the passes is to be expected, especially at the Southern Passes--the movement area of large-tonnage vessels with the right of unilateral movement [the right of way].

When large-tonnage vessels are entering or leaving port, movement along the Lenmorkanal [Leningrad maritime channel] practically shuts down for 2-3 hours, from the Leningrad entrance buoy to the Neva passes. The Leningrad maritime port is handling ships of about 100,000 deadweight tons even now. Their unloading is effected in stages: First, down to passage draft at the entrance

buoy; then at the Lesnoy Pier roadstead; and, finally, at the mooring. This operation takes 4-6 hours in good weather.

Thus, for example, at daybreak on 29 November 1982--at 1000--they began to bring in a vessel of about 100,000 deadweight tons, and they finished with her placement at a Lesnoy Pier mooring buoy at 1700. Meanwhile, 10 large-tonnage vessels accumulated in the port, having expected a turn for departure to sea. The weather worsened, and the wind velocity reached 20 meters per second [about 40 knots]. A rough sea arose at the entrance buoy, so that the pilot boat could not take pilots off vessels leaving port.

It was proposed to all 10 of these vessels awaiting departure to sea, that they proceed with the pilot to the Malyy Kronshtadt Roadstead, deliver him to a pilot boat there, and thence proceed independently through the Kronshtadt fairway.

Steering a large-tonnage vessel through these narrows--with frequent course changes in a strong side wind--is a highly complex operation, involving a certain risk. Therefore, the ship captains were compelled to refuse departure to sea. Their decision was influenced by the higher specific accident rate in the Kronshtadt fairways, which is explained by the obligatory reduction in vessel speed due to the complexity of navigation, frequent changes in the direction of ferry movement, and proximity of the Kronshtadt fort walls and harbors. It is more complex yet, to transit this region in the presence of ice movement.

Here is another practical example: Our large-tonnage ship safely took a pilot aboard at the Leningrad entrance buoy in conditions of limited visibility, and was proceeding into port under guidance of the "Raskat" base radar station (BRLS). In transiting the Bol'shoy Kronshtadt Roadstead, long before reaching the point for turning onto another course, there came an erroneous command from the BRLS operator to set a new course. Thanks only to continuous radar observation of the surrounding situation, did our navigators manage to correct the operator's error and avoid an accident. Later, we succeeded in establishing the cause of the error. It turned out that another vessel, which had already reached the turning point at that moment, was proceeding ahead. Just one thing remained unclear: How did she turn out to be ahead without the knowledge of the Traffic Control Post and the BRLS operator?

The construction of shore elements of the future flood protection system now is proceeding at rapid rates, but several questions related to the safety, control and intensity of navigation remain unanswered to this day.

Firstly, there is the straightening of the Leningrad maritime channel, in the sector from buoys 1 and 2, located in Malyy Kronshtadt Roadstead, to the underwater crib obstruction, according to the direction of the existing axis of the channel, 292.4 degrees - 112.4 degrees, that would eliminate the danger of navigation in the Krohshtadt fairways and permit increasing the speed of ship movement in the Leningrad maritime channel.

Secondly, for direct coordination of ship movement through the Northern and Southern Passes, it is necessary to have dispatcher posts at these passes, equipped with UKV [VHF] radio communication and RLS [radar stations]. Coordination of movement will permit timely regulation of the movement order of ships, especially large-tonnage vessels, increase the pass transit speed and rule out violations of the movement sequence. It is generally known that any violation of the movement schedule in the passes and approaches to them creates an accident situation, especially in limited visibility.

Thirdly, for intensification of large-tonnage vessel movement along the Leningrad maritime channel, deep-water anchorages are required, where meeting ships can await at anchor the passage of a large-tonnage vessel. There should be two such anchorages: One before the dikes of the closed part of the Leningrad maritime channel (132nd distance marker), and another in the vicinity of the Petergofskiy buoys. The intensity of ship movement in the channel, even now, demands the creation of such separation zones.

Fourthly, in limited visibility, the movement of ships in fairways of the Neva outlet and the Gulf of Finland must be effected by a base radar station. The "Raskat" station, built over 15 years ago, can't cope with the growing volume of operations. Moreover, the accuracy of its work, even now, fails to meet modern technical requirements. Therefore, the port is obliged to effect guidance of ships of about 100,000 deadweight tons only in good visibility and calm weather.

Fifthly, when there is a rough sea in the vicinity of the Leningrad entrance buoy, embarking a pilot from the pilot cutter and debarking him onto it are made difficult and, sometimes, entirely impossible. This problem can be solved by means of a helicopter in open roadstead conditions, something that is being practiced already in open roadsteads of the Elbe, Weser and Scheldt Rivers during stormy weather. It is necessary to make provision for the construction of a helicopter landing pad in the vicinity of the Southern Passes or on Kotlin Island. True, it must be noted that, due to design or because of deck cargo, by no means every ship will be able to provide for pilot landings and take-offs by helicopter. Therefore, it is necessary to make provision for pilot debarking onto a cutter in the Tallinn roadstead, or in another sheltered and convenient place. The latter alternative urgently awaits its decision even now.

12319
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DEVELOPMENT, OPERATION OF KAMCHATKA SHIPPING COMPANY

Moscow MORSKOY FLOT in Russian No 5, May 84 pp 8-10

[Article by Yu.Tereshin, chief, Kamchatka Shipping Company: "The Shipping Line on the Kamchatka"]

[Text] May 17, 1949 is the birthday of the Kamchatka Shipping Company, the easternmost shipping line in our country.

Today the line's transport fleet numbers in its ranks the newest automated ships of the "Rostock" and "Nikolay Zhukov" class, one of the first roro vessels in the Far East, the "Yuriy Smirnov", container ships of the "Yunyy Partizan" class, coalers, ore carriers and other specialized craft. A recent addition to our fleet is the latest type river-sea freighter the "Tikhon Semushkin" whose design allows easy access to below-deck space. This greatly facilitates and speeds up cargo handling.

The transport fleet carries all types of freight to and from Kamchatka except coal from Sakhalin and Petropavlovsk-Kamchatskiy and containers on the Vladivostok-Petropavlovsk line.

For our oblast the problem of raising the efficiency of maritime transport is getting more acute with every year. The developing industry and burgeoning population of the peninsula demand continuous expansion of freight and passenger traffic. Today more coal, clinker, construction materials, rolled metal, food and industrial products are brought to Kamchatka than at any time before.

In 1983 the productivity of the cabotage fleet grew 6.6 percent, allowing a 4.7 percent increase in the volume of goods delivered to various points in Kamchatka. Haulage of cargoes for the fishing industry, Kamchatka's most important, rose by 9.5 percent, which is a record for the company.

The volume of freight handled by company ports exceeded 4 million tons. This is 139 thousand tons more than in 1982, with general cargoes accounting for 52 percent of the increase and the entire increment achieved through greater productivity in loading and unloading operations. Haulage costs were down 6.8 percent, the target figure for profits was surpassed.

Every one of the company's enterprises undertook measures to save fuel and energy. In 1983 they economized over 3 thousand tons of conditional fuel and 114 thousand kilowatt-hours of electricity.

The ports and the ship-repair yard continued to perfect the various brigade forms of work organization with remuneration by the end result. By the end of 1983 the number of machine-operator dockers covered by the brigade method reached 23.3 percent of their total.

In 1983 seniority bonuses were paid out for the first time ever to workers doing loading and unloading. The process of transferring ship's crews to a new work-and-rest regime continued apace. All this allowed the mean monthly wages of port workers to rise by 3 percent and of workers in emergency rescue ship-repair and underwater technical operations (ASPTR) by 6.2 percent.

Our shipping company, which numbers among its subdivisions two seaports, a ship-repair yard, an ASPTR detachment, a capital construction and repair administration, a "Torgmortrans" office and other units, is directing all its efforts at achieving our main goal - the smooth operation of the fleet.

The base port is Petropavlovsk-Kamchatskiy. It has the largest volume of freight-handling operations.

The implementation of a whole complex of of organizational and technical measures created the necessary conditions for port workers to increase their productivity every year and for a steady rise in the level of the port's mechanization. The latter development has led to a continuing reduction in the time the ships spend under loading, unloading and auxiliary operations.

The collective of the Petropavlovsk-Kamchatskiy port has time and again won prize spots in the all-Union socialist competition. Working here are many labor veterans with 20 or more years on the job.

Justly ranked among the vanguard is the collective of the independent consolidated all-purpose brigade headed by Ye.Razmyatov. This is a komsomol and youth collective of 55 men, among them 12 communists and 22 komsomol members. 44 members of the brigade are shock workers of communist labor. Six have government awards, the brigade leader himself wears the Order of Labor Glory and is an elected member of the city soviet. The brigade boasts 40 top-grade specialists, it has the highest job-qualification rating and the lowest turnover of cadres. It was the first in the port to apply the coefficient of work participation in practice.

Over the past few years the port of Petropavlovsk-Kamchatskiy has undergone a visible transformation. The first phase of a container terminal has been commissioned, a large variety of high-efficiency hoisting mechanisms have been put into operation. The port is ade-

quately staffed by qualified cadres. All this enables it to cope with a rapidly growing volume of work in transloading international-standard containers. However, the technical potential of the transloading complex cannot be fully utilized because there is not enough open space for container storage. The 18-20 thousand shortfall of warehouse space could be compensated by the construction of another wharf, but this is a problem that can be resolved only with the help of the ministry.

Marching even with their colleagues are the port workers of Ust'-Kamchatka who are equally successful in ensuring the rhythmic processing of the transport fleet. This port is equipped with all the transloading equipment necessary to handle its volume of freight. Left to be completed is the construction of a lumber wharf; now is also the time to begin implementing measures aimed at initiating lighter traffic in the Far East basin.

One of the main tasks entrusted to the port workers of Ust'-Kamchatka is the towage of rafts down the Kamchatka river. The local timber is well known not only in our country, but is exported to Japan as well.

The brigade contract method has become widespread in both company ports. It is used in the processing of roros, grain and clinker carriers, containers, metal scrap, lumber and other cargoes. In the port of Petropavlovsk-Kamchatskiy 41 percent of all freight is handled by the brigade contract method, in Ust'-Kamchatka - 21 percent.

Among the other company enterprises the collectives of the ASPTR unit and the Torgmortrans office deserve special mention for excellent performance --they never fail to fulfil all their plans and socialist obligations.

However, in the current five-year plan period the company was unable to eliminate shortcomings in ship repair and capital construction. As a result, neither the year's nor the five-year plan's target figures for industrial and subcontracting activities were met, productivity in ship-repair operations and capital construction declined. The main reasons for the unsatisfactory performance of these subdivisions are a low level of work and production organization and an inadequate material base.

The processing of the fleet at all other points on the Kamchatka coast is done by the crews themselves while the ship rides at anchor on the roadstead. The company sends its own field team for the entire navigation season to points in the northwestern part of the Koryak autonomous okrug to ferry cargoes ashore and unload them. The overall annual volume of freight handled at these points is steadily rising and has already surpassed 112 thousand tons. In spite of the existing difficulties, the company does manage to deliver cargoes to seaside points assigned to its charge and every

year even achieve a reduction in the amount of time the fleet spends under transloading operations.

A source of great anxiety for us is the unsatisfactory processing of the fleet at coastal points subordinated to the "Kamchatrybprom" association of the Ministry of the Fish Industry. Non-productive ship downtime at these points is growing. In 1983 it totalled 1060 ship-hours, 162 more than in 1982. The technical base of these points has not been developed over a number of years; the transloading mechanisms and flotillas are in a bad state, most must be replaced by new units.

The growing scope of transport operations, the need to improve their efficiency and quality called for new, more advanced forms of cooperation between various types of transport. Accordingly, in 1978 the Kamchatka transport terminal was created with the port of Petropavlovsk-Kamchatskiy as its nucleus. The period of its existence saw an improvement in the planning and organization of freight removal from the port area, a reduction in cargo storage time and an increase in the volume of freight removed by the terminal's enterprises. The removal of cargoes from the port increased by 27 percent, the gross rate of fleet processing - by 23 percent.

To further develop cooperation between the terminal's enterprises comprehensive intersectorial socialist competition was organized. Based on the point system, it allowed a more accurate assessment of each participant's contribution. Mutually coordinated planning made for speedier delivery of cargoes to Kamchatka recipients.

All this obligates us to find additional ways of ensuring the rhythmic functioning of the fleet. One of these ways is to improve the technology of freight haulage.

Widely resorted to at the present time is haulage of cargoes in 20-foot containers. Our ports can and do handle these shipments in their entirety, but the consignees, because they have no transloading mechanisms, access roads or sufficient storage space, are impeding the progress of containerization. In addition to the latter, concrete measures are being undertaken to increase the volume of packet cargoes.

Transported in 1983 were 140 thousand tons of freight in containers and 321 thousand tons in packets.There are an additional 200 thousand tons of container and packet-ready cargoes, but due to a shortage of containers and packeting equipment are carried by the piece.

The December (1983) plenum of the CPSU Central Committee set a specific goal - to increase productivity by 1 percent and reduce costs by 0.5 percent over and above assignment.

Four our shipping line this translates into 500 thousand rubles of above-plan profits and the freeing of 5 men now on loading and unloading operations. Furthermore, a reduction in ships' non-productive idle time by only 25 percent would release the transport fleet for 14 full days of additional work.

These are realistic, quite fulfillable tasks, and the collective of the Kamchatka Shipping Company will do everything necessary to carry them out.

12258
CSO: 1829/323

DETAILS OF NEW CASPIAN SEA RAIL FERRIES

Moscow MORSKOY FLOT in Russian No 5, May 84 pp 41-43

[Article by V.Kuzovkin: "Train Ferries for the Caspian"]

[Text] Presently functioning in the Caspian is a sea rail ferry between the ports of Baku and Krasnovodsk, a distance of 160 miles. The line is serviced by ferryboats of the "Sovetskiy Azerbaijan" and "Gamid Sultanov" classes built in 1962-1968. Because of the continuously expanding cargo flows across the Caspian and considering the age of the craft, the need arose to have new ferryboats built. These were ordered at the "Uljanik" (Yugoslavia) shipyard, with deliveries set for 1984-1986. The new boats differ significantly from their predecessors due to the new venue of their construction and additional limitations on their design stemming from their having to get to the Caspian by inner waterways.

The requirement to limit the boat's width precludes any possibility of fitting four pairs of railroad tracks on its car deck to link up with the existing ferry wharf and bridge. A compromise solution was reached - to roll the files of cars onto the ferry along the two middle tracks of its sren, then, using the switches, distribute them over all four tracks. With the ferryboats currently in use the cars are rolled on over the four tracks simultaneously.

The new ferryboats are designed to transport freightcars of the "1-T" and "T" types, refrigerator sections, passenger railcars, hazardous caegoes, automobiles and trucks. They have a closed railroad-car superstructure along the entire length of the vessel and a cargo hold for automobiles under the railroad-car deck. All the cabins of the crew are situated above this superstructure. This is in marked difference to the existing ferryboats where part of the crew's quarters is located over the railcar deck, resulting in justified complaints from the seamen about the heavy noise caused by the cars. Also situated above the railcar superstructure are passengers' cabins and washrooms for passengers and crew, The engineroom is in the aftersection of the ship which has two screws, two rudders and a bulbous bow.

The craft are being built according to USSR Registry of Shipping rules for class KM * LZ [I] A2 vessels (automobile-passenger rail ferries).

The ship's hull is pieced together on the fore-and-aft principle and up to the top deck is executed in steel. The superstructures above the top deck are crafted of an aluminum-magnesium alloy to reduce the ship's cargoless mass. Special attention is given to the assembly where the hull meets the aluminum superstructure, this to protect the hull from electrochemical corrosion.

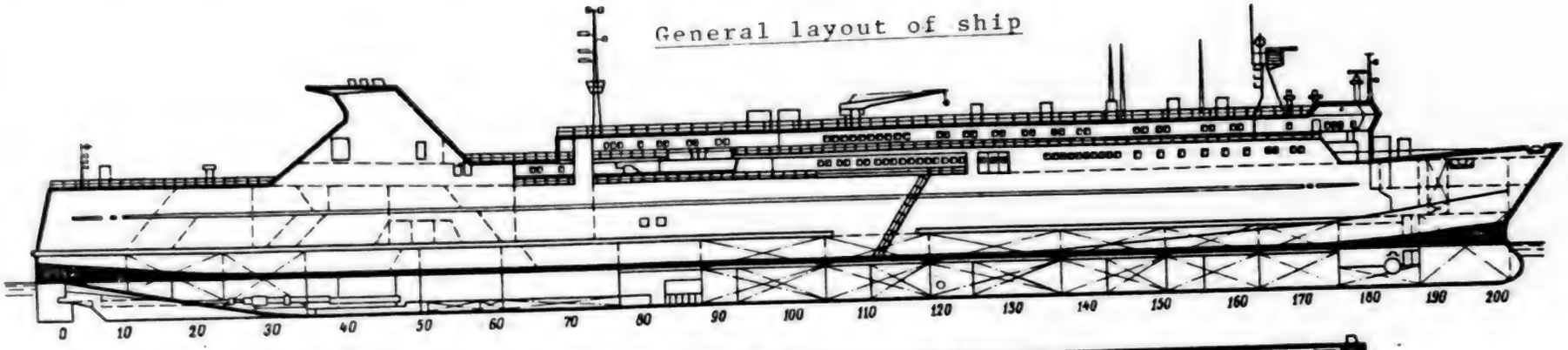
The design of the aftersection's above-water part is similar to that of the existing ferryboats in that it has to interlock with the ferry bridges in Baku and Krasnovodsk. The durability of the railcar deck is such as to withstand an evenly spread load of 2.5 tons per sq.meter. Serving as rails are square strips of rolled steel 60 x 60 cm in size.

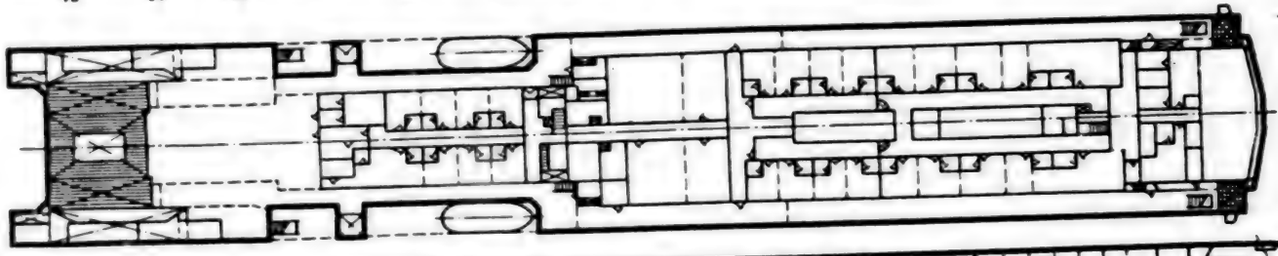
Main characteristics	New ferryboat	"Sovetskiy Azerbaijan" (Series I/Series II)
Length, meters		
maximum	154.5	133.7
at waterline	147.0	127.2
Width, meters		
along railcar deck	17.5	17.8
maximum (with mooring beam)	18.3	18.3
Height, meters		
up to railcar deck	7.3	6.2
up to top deck	13.4	12.3
Draft, meters	4.2	4.1
Deadweight, tons	2970	2510
Automobile capacity (for VAZ cars)	70	40
Passenger capacity	202	289
Main engines	6K45 GFCA	3D100/14D100
Speed, knots	17	16/17

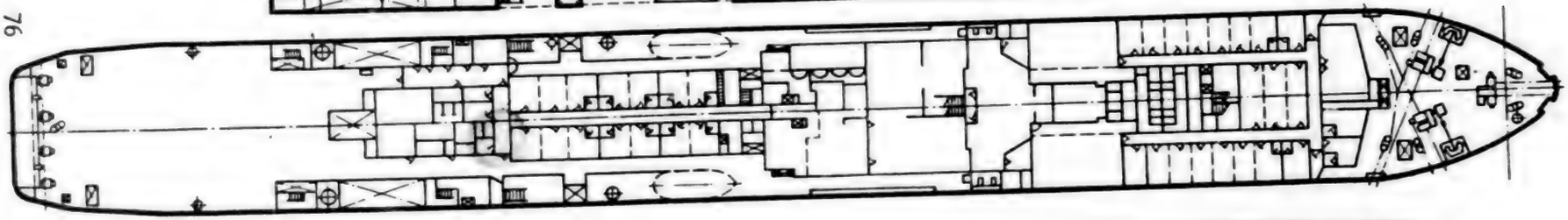
The space below the railcar deck is subdivided into watertight compartments in a mixed lengthwise and crosswise pattern. Installed in the cargo hold area at a distance from the ship's side equal to 1/5 of its width are longitudinal bulkheads which facilitates the process of getting the automobiles into the hold. The engine room occupies three compartments separated from each other by watertight bulkheads with doors.

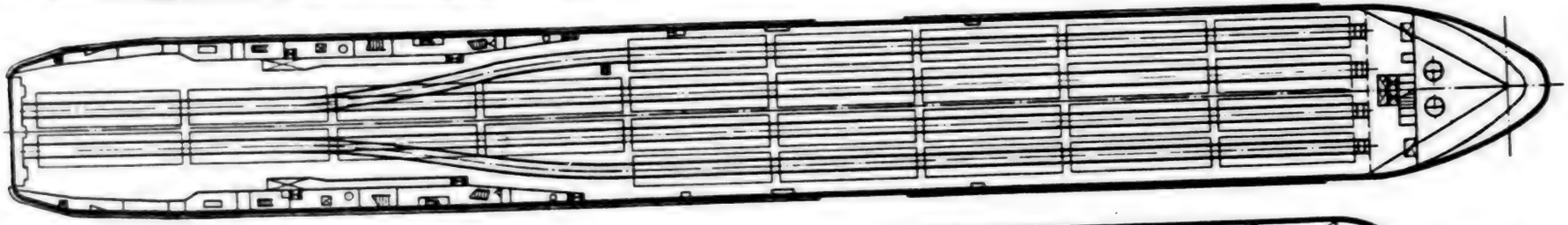
The automobiles are offloaded from a railway bridge onto the railcar deck of the ferry and from there down a stationary ramp into the hold. The ramp is 17.5 meters long and 3.5 meters wide. The hold can accomodate 50 automobiles of the "Zhiguli" class. 20 more can be stowed in the aftersection of the railcar deck in addition to the railcars there.

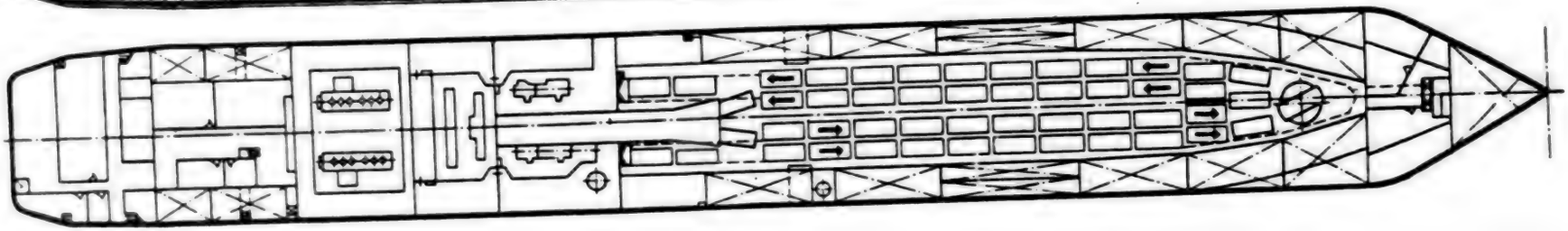
General layout of ship











The aperture in the railcar deck for passage of automobiles into the hold is coverable by a watertight hydraulic-driven lid. There is an automobile turntable, a circle 5 meters in diameter with hydraulic drive, in the bow section of the hold. Installed on the double bottom, it greatly facilitates and speeds up the placement of the automoboles in the hold. The aftersection in the railcar superstructure is closed by a hydraulic-driven door 13.3 meters wide and 5.5 meters high.

The railcars are secured with the aid of jacks and chain braces with pneumatic tightening, the automobiles - by synthetic belts.

Brake release of the railcars is effected by feeding air to the brake system of each line of cars with the aid of standard railroad equipment used in our country.

To reduce rolling the ferryboats are equipped with an active roll-pacifying system using controlled port and starboard rudders. The system allows to reduce the roll amplitude from 19 to 4° at a speed of 17 knots in a 7-point storm.

To right the ferry's list during loading operations and hold it to a level dictated by the operational characteristics of the shore bridge (not more than 3°), the vessel is equipped with an automated antilisting system which uses U-shaped tanks. The system allows railcars to be onloaded assymetrically without causing the ferry to list under a weight differential of up to 1470 kilos compared to the cars on the opposite side.

The anchor and mooring system of the ferries includes 2 combined anchor and mooring winches, a mooring winch in the foredeck and 2 mooring winches in the aftersection of the railcar deck. Two Hall anchors each with a mass of 3.3 tons are deployed ready for action right on the foredeck. The anchors can be dropped by remote control from the wheelhouse.

To enhance their maneuverability during frequent moorings the ferries have in their forepart a 588 kwt (800 hp) approach-steering mechanism equipped with a regulating screw.

The emergency equipment of the ferry consists of two partially covered plastic engine-equipped lifeboats with a capacity of 50 and 60 people respectively, and 11 inflatable rafts each capable of carrying 25 persons. The rafts are lowered together with their passengers by 2 specially installed cranes.

The crew of the ferry is 57 strong.The senior officers are housed in 6 block-type cabins, the officers in 13 single-berth and the men in 19 double-berth cabins. All the cabins have their own toilet facilities. In addition, 16 more men can be accomodated in the four-berth cabins designated for repair crews.

The passengers are housed in two and four-bunk cabins and in 2 salons with 59 airplane-type seats in each. At their service are a self-serve restaurant with a bar, a rest salon, baggage compartment, storage area and mothers' and childrens' cabins.

All the crew's quarters and the crew's and passengers' public facilities as well as part of the service areas are equipped with an air-conditioning system specially designed for the Caspian climate.

Passengers embark and disembark either along a gangway or through on-board embarkation gates about 2 meters wide. When the number of passengers is large these are more convenient than the long and narrow gangway but call for the installation on the ferryboat jetty of a stationary gangway-portal.

The propulsion unit of the ferries consists of two 8-cylinder diesels of the 8K45-GFCA type linked directly to the regulating screws. The maximum long-term power of each engine is 4.35 megawatts (5910 hp) at 234 rpm. The engines are produced by the Yugoslav firm "Uljanik" on license from the "Burmeister and Wein" company.

The boiler unit consists of an auxiliary boiler with an output of 3 tons per hour and a utility boiler producing 2.5 tons per hour.

The ferries' power station consists of three auxiliary diesel generators of 600 kva each and one emergency 125 kva diesel generator.

The power unit is automated in accordance with USSR Registry of Shipping class A-2 for unmanned operation of the engine room with the watch on duty at the central control panel. The ballast system, which is activated, among others, during the onloading of railcars, is serviced by two ballast-removing pumps feeding 250 cubic meters per hour.

The ferries are equipped with a low-pressure carbonic-acid system to fight fires in the railcar superstructure, hold and engine room. Also installed is a foam firefighting system with a mean multiple factor of 1:100.

The special conditions of the Caspian Sea call for strict measures to prevent its pollution by garbage, oily refuse liquids and fecal sewage. The waste matter can be processed and destroyed aboard ship or collected and brought ashore. To this end the ferries are equipped with an incinerator for burning solid and liquid waste products and with storage tanks for waste liquids and sewage, including dirty water from washing the decks.

The steadiness, loading and boarding of the ferries is monitored by a stalodicator which measures the amended metacentric height, the deadweight and the trim of the vessel.

The navigational equipment of the ferries includes 2 radar stations, a radiogoniometer, a radionavigation system, an echo sounder and an induction log, all of which make for safer sailing.

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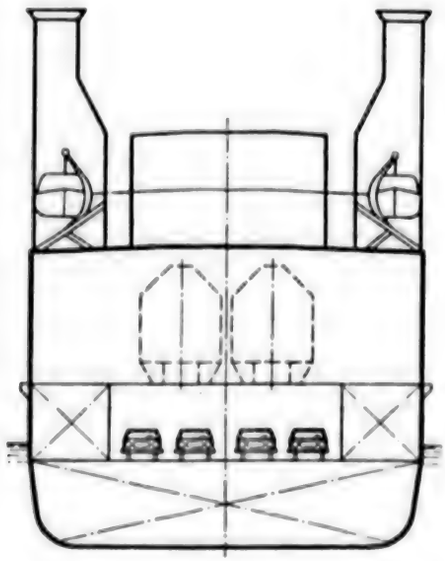

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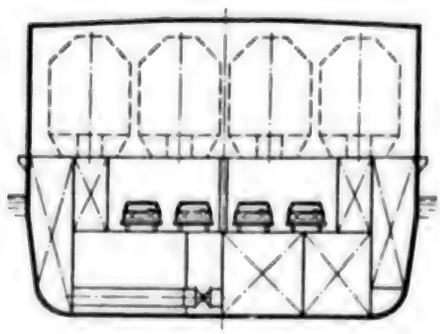

1. Cross-section at frame No 90.
2. Cross-section at frames 120 and 130.

12258
CSO: 1829/323

EDITORIAL NOTES INLAND WATERWAY ACCIDENT RATE

Moscow VODNYY TRANSPORT in Russian 16 Aug 84 p 1

[Editorial: "For the Safety of Navigation"]

[Text] We often hear the words: "The most important in the work of a riverman --the safety of navigation!" This sentence clearly expresses one of the most important features of labor in inland waterway transportation. It is precisely here that even the slightest neglect of safety requirements is fraught with a threat to the life of people and entails enormous losses of physical assets and interruptions in the pace of the transportation conveyer, and this means the failure to deliver millions of tons of most important national economic cargo to consumers. Thousands upon thousands of navigators and port workers have a very clear idea of this. Many renowned captains are working on the country's rivers, for whom the safety of navigation has become a law, a vital necessity. Widely known are the names of Volga captains B. Belodvortsev and M. Lisin; Siberian captains V. Manakov, Ya. Panovik, V. Tsoun, N. Vlasyuk and G. Sukhanov; Dnepr captain P. Zhuk; and many other leading commanders of the fleet, whose selfless labor is pride of Soviet rivermen. Realizing their lofty reponsibility before the motherland, they and many of their followers have pledged to make this year's navigation season a shock labor navigation season by devoting it to the 40th anniversary of the Soviet people's victory in the Great Patriotic War, to strengthen discipline in every possible way, not to permit a single case of violation of regulations and to sail without accidents.

The volume of shipments via inland waterways is growing year after year in our country, and the frequency of shipments and the traffic intensity of transport vessels are increasing. Consequently, the control over precise and unconditional fulfillment of navigation rules by all navigators without exception must be more severe and demanding.

Unfortunately, this by no means is the situation everywhere. Often in investigating an accident it bcomes clear that man deviated from the rules and grossly violated the service regulations on vessels of the river fleet, instructions and orders. The result, as a rule, is sad and bitter-- an accident!

This is confirmed by an incident which had occurred with the motor hip " G. V. Plekhanov" on the Volga, near the city of Cheboksary. Instruction documents forbid the movement of vessels here under conditions of limited visibility.

On account of a severe fog, I. Dolovskiy, captain of the motorship "G. V. Plekhanov," ordered to drop the anchor and strictly warned the second navigator, who was standing the watch, not to sail until good visibility sets in. A half hour after this order, second navigator Yu. Vrulin requested the Cheboksary port dispatcher over the radio and asked for permission to continue the voyage. He was forbidden to do this. Fifteen minutes later Yu. Vrulin again requested permission to move out. He was warned for the second time that there was a severe fog on the river. Without informing his captain, the navigator gave an order to begin the voyage. The result of the gross violation of regulations--collision in fog of the motorship "G. V. Plekhanov" with the Volga catamaran "Nikolay Shelukhin." A serious material detriment was caused to the state.

Measures, which contribute to ensuring safe labor conditions and preventing accidents, have been developed and confirmed in all river shipping companies and basin administrations of waterways. Many documents have been written in this connection. It is bad, however, that quite often these measures are simply forgotten.

Thus, provision has been made for duty on roadsteads by leading workers of shipping companies. But is it being fulfilled everywhere? Some shipping companies do not conduct roadstead meetings with command personnel of vessels, do not bring to the attention of river crews the information on accidents and do not investigate them in detail.

Quiet often instances are still being permitted of people without necessary practical skills being appointed to ship navigation duties. Captains and navigators, through whose fault the accidents did occur, are not suspended from duty. S. Chizhov, second navigator of the steamship "Dzhambul" of the Bel'sk Shipping Company, caused a severe accident on 2 July this year, but was not suspended from work. Exactly 10 days later, he caused a second accident while still occupying a command position.

Such practice, of course, does not promote strengthening of labor discipline and reducing the accident rate. Instances have not been eliminated when some commanders of the fleet report for watch in a drunken state. Thus, A. Panin, captain of the motorship "Moskva-1" of the capital's shipping company, while being at work in a state of severe intoxication, has caused an accident by striking a girder of the Ust'inskiy bridge on Moscow River.

No, there is no room inthe river fleet for lovers of alcohol! It is necessary to close firmly and forever the passage to the captain's bridge and the engine room to all admirers of the "green serpent."

Operation of vessels with defective mechanisms and devices is still being allowed in shipping companies and basin administrations of waterways. Thus, out of the 24 vessels of the Moscow Shipping Company, which were spot checked, eight are in unsatisfactory condition. This also could have led to severe accidents.

A few days ago, the Collegium of the Ministry of the River Fleet has discussed the question on the state of affairs as regards the accident rate on vessels

and in ports. During the discussion it became clear that the following shipping company supervisors: K. Korotkov of the Volga Unified Shipping Company; V. Permyakov of the Volga Tanker Shipping Company; Yu. Makarenkov of the Moscow Shipping Company; A. Shurmin of the Kama Shipping Company; V. Khudyakov of the Bel'sk Shipping Company; V. Fomin of the Northwestern Shipping Company; V. Makeyev of the Pechora Shipping Company; S. Fomin of the Yenisey Shipping Company; A. Sukhov of the Amur Shipping Company; and others have been doing little work aimed at unconditional fulfillment of measures for preventing accidents, have not made proper demands of captains of vessels and dispatcher staff for strict fulfillment of rules and provisions ensuring safe navigation and have permitted formalism in indoctrination work with command personnel of vessels.

The collegium has demanded from all supervisors of shipping companies and basin administrations of waterways that they strictly observe measures aimed at preventing accidents and promote strengthening of labor and production discipline in the river fleet.

9817
CSO: 1829/409

BRIEFS

NUCLEAR SHIP 'ROSSIYA'--Leningrad (TASS)--Shipbuilders of the Baltic plant imeni S. Ordzhonikidze have begun assembly of basic structures of the nuclear "heart" of the ship for polar seas--the new nuclear ship "Rossiya." The work, which requires skill and reliability, is being conducted according to an accelerated schedule prompted by the lofty pledge of Baltic shipbuilders--to build the nuclear ship 1 year ahead of the planned period and to dispatch it on its maiden voyage by the upcoming 27th party congress. "We regard construction of the 'Rossiya' as the main order of the five-year plan, and every day of work at the fitting-out pier convinces us that we will keep our promise," said plant director V. Shershnev. "Shipbuilders of the Baltic hope," V. Shershnev stressed, "that the shock construction pace of the 'Rossiya' will be supported by related enterprises, after all the nuclear ship is being built practically by the entire country--more than 450 enterprises, organizations and scientific centers of many cities in the republic." [Text] [Moscow IZVESTIYA in Russian 19 Jul 84 p 2] 9817

SHIPS FROM BULGARIA, AUSTRIA--In accordance with contracts of the All-Union Association for the Import of Ships [Sudoimport] and the Koraboimpeks Foreign Trade Enterprise of the People's Republic of Bulgaria, two new containerships with a carrying capacity of 25,000 t each and equipped with automated navigation systems have been turned over to Soviet customers by shipbuilders of the shipyard imeni Georgiy Dmitrov in Varna. Contracts of the association and the Linz-Kornoiburg shipyard (Austria) provide for delivering to the USSR in 1985 of six various type vessels, including a river passenger motorship for 180 passengers. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 31, Jul 84 p 21] 9817

TANKER 'MARSHAL BAGRAMYAN' LAUNCHED--Kerch (TASS)--The tanker "Marshal Bagramyan" with a carrying capacity of 65,000 t has been launched at the Zaliv Shipbuilding Plant in Kerch. All production processes on the vessel are automated, and the double hull reliably protects seawater from pollution by oil products. The new tanker will not require sea trials. With the aid of special devices, its power unit, auxiliary mechanisms and the automatic control system will be checked here at the berthing wall. [Text] [Moscow VODNYY TRANSPORT in Russian 14 Aug 84 p 1] 9817

CRANES, TUGS FROM HUNGARY--Hungarian shipbuilders have begun fulfilling a new, large order. The collective of the Budapest Shipbuilding and Crane Plant will

deliver five floating cranes to rivermen of the USSR. Twenty river tugs will also be delivered to the Soviet Union. At present, the vessels which were built by workers of one of the leading enterprises in the Hungarian capital are reliably operating in various geographic latitudes. The most close ties link the shipbuilders with CEMA-member countries and, first of all, with their partners in the Soviet Union. A total of nearly 3,000 floating cranes have already been launched from the building slips of the enterprise, a part of which, for example, are being used on rivers in Siberia. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Aug 84 p 1] 9817

ORE CARRIER 'NIKOLAY KUZNETSOV'--A large ore carrier has been launched by the shipbuilders of the Okean Shipbuilding Plant in Nikolayevsk. On the side of the vessel is the name of Nikolay Kuznetsov--Hero of the Soviet Union and legendary intelligence agent of the Great Patriotic War. The ore carrier's carrying capacity is 50,000 t. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 32, Aug 84 p 3] 9817

CSO: 1829/409

PORTS AND TRANSSHIPMENT CENTERS

BRIEFS

NEW PORT ON DANUBE--A new modern river port is under construction in the Danube city of Kelerashi. It will be connected to the Danube by a 6-km channel, which can be used by barges of 3,000-t carrying capacity as well as by vessels that ply the recently commissioned Danube-Black Sea channel. Work on the new channel route has entered its concluding stage. The new port will have a 120-ha water area. Its freight turnover will total 12 million t a year. This is the third modern highly mechanized river port built on the Danube in the past 10 years. [Text] [Moscow VODNYY TRANSPORT in Russian 28 Jun 84 p 1] 9817

ODESSA CARGO ACCOUNTING SYSTEM--Odessa (TASS)--The dispatching of vessels from the berths of Odessa commercial seaport has been speeded up following the introduction of an automatic argo accounting system. This work was formerly done by more than 30 people, who quite often did not have time to complete all necessary operations. A so-called tackle sheet is now filled out directly at a place of loading. Then the data on the progress of cargo transshipment is relayed via visual displays to the computer center. Here a computer summarizes the information, prints the result on forms and memorizes it. Detailed information on every hold and vessel as a whole can be obtained during the progress of loading. This helps the port's management in maneuvering people and equipment efficiently. The annual economic effect from introduction of the automatic cargo accounting system amounts to nearly R500,000. In the future it is planned to assign an electronic computer to serve all enterprises which participate in cargo transshipment via the Odessa Transportation Center. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 5 Aug 84 p 2] 9817

BAKU PORT BERTHS REBUILT--Baku (TASS)--The berths of the Baku seaport are ready to receive vessels with horizontal method of loading. Their fundamental rebuilding has been completed. "The ferry crossing," port chief T. Akhmedov said, "does not have the traditional cranes: railway cars drive in a hold directly from a berth. The new dry cargo vessels will be loaded in the same manner. Only instead of cars, the cargo will be placed in special trailers." As a result, loading and unloading work in the port will be speeded up almost twofold and can be handled with less manpower. Construction of the first trailer vessel for Caspian seamen--the dry cargo vessel "Kompozitor Kara Karayev"--is nearing completion in the GDR. The replenishment of the fleet of the Caspian Maritime Shipping Company is progressing at an accelerated pace. This year, new dry cargo vessels, which are equipped for hauling large-size containers, have appeared at Baku berths. Modernization of the Azerbaijan oil refining industry and the increased fuel production connected with this have made the expansion of the tanker fleet necessary. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Aug 84 p 2] 9817

FLOATING TRANSSHIPMENT COMPLEXES--Odessa (TASS)--Floating transshipment complexes have begun operations at the Ust-Dunayskiy port. This makes it possible to handle not only hauling lighters directly on the roadstead but large-capacity seagoing motorships as well. The first bulk carriers have already been unloaded in this manner. As a result of using original vessels, which have powerful transshipment complexes installed on them, the harbor's handling capacity will be considerably increased. [Text] [Moscow VODNYY TRANSPORT in Russian 21 Aug 84 p 1] 9817

VESSEL LEAVES KRASNOYARSK SHIPYARD--Krasnoyarsk--A floating plant for the production of granulated vitamin-grass meal has left the berth of the Krasnoyarsk shipyard on its maiden voyage. Its productivity is 1.5 t of fodder per hour. Rural workers have properly assessed the assistance of the rivermen. [Text] [Moscow VODNYY TRANSPORT in Russian 25 Aug 84 p 1] 9817

CSO: 1829/408

INTERSECTOR NETWORK DEVELOPMENT

UNIFYING ENTITY NEEDED TO COORDINATE INTERSECTOR SHIPPING

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 5 Jul 84 p 2

[Article by A. Voronov, academician, chairman of the USSR Academy of Sciences Scientific Council on the Comprehensive Problems of Transport Process Administration: "The Transport Complex: A Specialist's Opinion"]

[Text] Transport has rightfully been called the economy's circulatory system. More than 90 million tons of freight everyday travel over steel, highway, water, and other arteries. Approximately 17 billion rubles a year are allocated for the development of the transport complex. Transport is furnished with new, up-to-date technical means, new mainlines are laid, and traffic speeds are increasing.

It would seem that goods must be delivered more rapidly "from door to door." But this has not occurred. In recent years their movement has even slowed down. The magnitude of inefficiency in hauling is enormous. Because of a lack of coordination among the different types of transport, millions of tonsof freight are held too long at transshipment points. The cost of such "frozen" resources not entering into economic circulation for a lengthy period of time is calculated to be in the billions of rubles.

Why does this occur? Primarily because,in outfitting transport technically, too little attention has been paid to the organizational aspect of the operation of the entire transport complex and to coordinating the activities of closely allied sectors. Railroad workers, rivermen, truckdrivers, and seamen do not yet have a precise concept of joint actions, based on a reliable, correct foundation.

They are pulled in different directions by overlapping regulations, uncoordinated rates, and variations in departmental indicators. Attempts have been made to explain the disconnectedness by specifics. Yes, each type of transport does have its own characteristics. Nevertheless. there is something in common among them. The final, national-economic result of the activity of each of them is the delivery of goods. And hence we can plan the work, taking into consideration the most complete and effective loading of each unit, its highest productivity; we can determine a unified technical and investment policy.

We will not succeed in solving this important problem by the efforts of divided transportation departments. Today there are about 40 such departments,

including the republican ministries of motor transport, roads, and highways. Capital investments are literally being pulled in all directions. And, as a result, inefficient use is being made of monetary means, material-technical and human resources, the growth of labor productivity has been weak, and hauls have become more expensive.

A way to avoid many negative consequences is seen in optimizing the administration of the hauling process, in precisely coordinating the activities of all its participants. Nowadays the national economy is suffering enormous losses at the juncture points of different types of roads. And this is understandable: the transport complex has no unified administrative organ, no coordinating center which would find not a departmental but a state type of solution to disputed problems, which would smooth out the sharp angles and grind down the rough places at the juncture points.

It has become completely obvious that we need a scientific concept for the comprehensive development and administration of the transport sectors; we need to work out a general scheme for planning and managing the hauling process for the country as a whole and for its individual regions. Integration of efforts is a requirement of life. Practical experience has suggested such a progressive form of coordination as transport complexes.

Recently the Coordinating Council of the GKNT /State Committee on Science and Technology/ and the Presidium of the USSR Academy of Sciences, along with representatives from the Ministry of the Maritime Fleet, Ministry of Railways, RSFSR Ministry of the River Fleet, and the RSFSR Ministry of Motor Transport, thoroughly analyzed the operation of the Leningrad Transport Complex. This is a major intersection of maritime, river, railroad, and motor-vehicle routes. All the problems of inter-action among closely allied workers are concentrated here. In essence, this is a testing grounds where the new methods of coordination are being worked out.

In 1978 the Leningraders proposed that the closely allied workers should operate in a unified rhythm, based on a mutually coordinated, continuous-type plan-schedule. This experiment was approved by the CPSU Central Committee. The results of the mutual cooperation speak for themselves. As compared with the base year of 1977, the volume of goods transshipped through this transport complex grew by a factor of 1.7. The hauling out of import goods from the seaport by railroad more than doubled, by motor transport--it increased five-fold, and by river vessels--almost eight-fold. More than twice as much freight is now being processed by the direct variant than was the case six years ago.

But the more precise coordination has also revealed new and serious problems. Because, of course, a transport complex is merely an intersection on the route from the supplier to the consumer. And the rapid passage of goods through here still does not guarantee that their delivery as a whole will be speeded up. What is required is coordination on a higher level--we need a transport-technology system which would effectively influence the movement of the goods-flow along their entire route from dispatching to receiving.

On this score the Leningrad transport workers have an interesting idea, one which is supported by the party obkom. Its essence lies in setting up at the

complex, based on up-to-date computer equipment and means of communication, an inter-regional transport-technological system, which would coordinate the actions of the participants in the hauling conveyor not only at the transport complex but even beyond its limits. Individual units of this system are already in operation. Let's say, for example, that the VAZ [Volga Motor-Vehicle Plant] or the KamAZ [Kama Motor-Vehicle Plant] has just completed a batch of motor vehicles to be shipped out to the Leningrad Seaport; the teletype here has already banged out all the necessary information: the country of destination, the plant number of the motor vehicle, and even the color of the body. The port workers prepare the receiving-and-dispatching and other accompanying documents in good time. This sharply cuts down on the idle times of transport means.

Included within the over-all system should be not only the transport workers but also the major suppliers and consumers, the USSR Ministry of Procurement, and the foreign-trade organizations. This idea was unanimously (a rare instance) supported by the representatives from the Ministry of Railways, Ministry of the Maritime Fleet, the RSFSR Ministry of the River Fleet, RSFSR Ministry of Motor Transport, as well as the Coordinating Council of the GKNT and the Presidium of the USSR Academy of Sciences.

Such inter-regional transport-technological systems, it is thougt, constitute a legitimate step in the further development of mutual cooperation among workers in closely allied fields, the next stage along the road to a unified, all-state system for administering the transport complex. Today this road is blocked by departmental barriers. Coordinated agreement among closely allied workers at transport complexes, also including the Leningrad Complex, is constructed on what are termed "gentlemanly principles"; it is achieved with the help of the local public organs--commissions and councils. But it is impossible to redistribute funds among the sectorial sub-divisions through them. As they say, friendship is friendship, but finances is each person's own business.

For example, the through-put capacity of many ports is 25--30 percent higher than the capacity of the railroad sidings and motor-vehicle roads. Because of this, the aggregate through-put operation of a transport complex is reduced. In order to eliminate such disproportions, we must calculate the "bottlenecks." But a road cannot be bridged merely by good intentions; funds are needed. Naturally, the seamen will not give them to the railroad workers or the truckers. But if there were an organ which efficiently administered the transport conveyer and could redistribute the funds and haul volumes so that the best use were to be made of the capacities of each of the partners in the complex, then the problem would be solved simply. But there is no such organ either in the localities or at the center.

The following rejoinder could be made: well, you know, there are sectorial divisions functioning within USSR Gosplan, USSR Gossnab, the GKNT, and numerous inter-departmental commissions. To be sure. But these organs are still engaged merely in planning the development and operation of transport for a year or a longer period of time. But operational planning, the coordinated administration of a transport complex, remains outside of their jurisdiction.

The specialists think as follows: we need a fully empowered organ which would solve over-all transport problems and make a business-like disposition of all the links in the hauling conveyer.

At the April (1984) Plenum of the CPSU Central Committee K. U. Chernenko said the following: "We have now proceeded to the multi-faceted improvement of the system for administering the national economy, and we are seeking out new forms and structures of economic activity....

"And, since the matter of administration has come up, I cannot skirt around the problem of curtailing the administrative apparatus. Work on such curtailment must be conducted not only on the lowest and middle levels of administration but also at its summits, so to speak."

Unification of the management of all types of transport allows us to solve this problem at the same time. There are dozens of main administrations in every transport ministry today. And certain of them are engaged in essentially one and the same matter--like fire-fighters they are eliminating breakdowns at junction-points. Concentration of these functions in one unit is the path to a sharp curtailment of the apparatus and an increase in its productivity and effectiveness.

The question of an over-all transport organ is not a new one. Let's recall that in our country, when a particularly precise operation of transport was required, its management was entrusted to a single pair of hands. In accordance with the statute on the RSFSR People's Commissariat of Railways (1921), all railroad, inland waterway, and maritime routes on the territory of the RSFSR were unified into an over-all All-Russian network and were completely under the jurisdiction of the RSFSR NKPS [People's Commissariat of Railways]. Operating here were centralized administrations of railroad, river, maritime, and local transport. During the years of the Great Patriotic War a unified Transport Committee was formed under the State Committee for Defense.

What does the adminstrative structure of the hauling complex look like now? It is headed up by an over-all transport organ, which concerns itself with economic, technical, technological, commercial, legal, and other problems; it distributes the amounts of hauls by types of transport as well as coordinating their operation as a whole and in terminals. Does this not replace the functions of USSR Gosplan? By no means. Gosplan allocates funds for the development of transport by specific sectors, taking into account the high-priority economic and technical developments. Directly engaging in hauling operations are the administrative organs of the various types of transport--railroad, motor-vehicle, maritime, river, etc. This is a theoretical scheme. In order to put it into practice, we need to have profound scientific work, a concentration of the forces of transport scientists on solving the basic, fundamental problems. Today the transport complex has risen to a qualitatively new level. It is difficult to manage it effectively and to forecast its development without the participation of a great deal of science and an inter-sectorial system. The lack of a unified client has led to a fractionation of scientific research, the creation of numerous departmental ASU's [Automatic Control Systems], which at present are planned as enclosed sectorial systems, without recourse to the inter-sectorial, not to mention the state, level.

The Institute on the Comprehensive Transport Problems under USSR Gosplan could become the center for basic scientific research on transport. In our opinion, it should also be made an academic institute. Then it would indeed be able to study comprehensive problems for the future.

Improving economic structures is, of course, a complex matter. But one thing is clear--the transport complex needs a more effective administrative system.

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INTERSECTOR SHIPPING COORDINATION PROBLEMS EVIDENT

Moscow SOVETSKAYA ROSSIYA in Russian 4 Jul 84 pp 1-4

[Article by the Raid Brigade: V. Manokhin, chief of service of container and package hauls of the Transbaykal Railroad; A. Sibiryakov, supernumerary inspector of the Blagoveshchensk Municipal KNK [Committee on Science and Technology]; G. Simanovskaya, deputy chief of the Shimanovskaya Station; Z. Shingareva, deputy editor of the newspaper MOSKOVSKIY ZHELEZNODOROZHNIK: "An Interrupted Route"]

[Text] Practically all the items produced in this country are delivered to the customers in railroad cars, in the holds of ocean-going and river ships, or in trucks. Under these conditions the deadlines for completing the hauls are of special importance. Unfortunately, the time has not yet come when we can say that matters are favorable in this sphere. A significant amount of finished goods are jammed up at the juncture-points of different type of transport. But, as the statistics bear witness, there is no less an amount of items standing still at the juncture-point between transport and production. According to data of the Ministry of Railways, approximately 2 million tons of material goods remain unhauled every month at railroad stations--the terminal points of arrival.

They Got the Wrong Address

The indoor warehouse at the Ryshkov Freightyard, which is located in Kursk Oblast, occupies about 8,000 sq. meters of area. And it is entirely packed with bales of tobacco and sacks of sugar. In their over-all total by the end of June the stations of the Kursk Section had piled up more than 5,000 tons of freight items. Senior dispatcher V. V. Milenina, however, has taken all this calmly, as an everyday matter:

"But is that really so much? You should have seen what the situation was here about 10 days ago. It was impossible to get through; there was no place to put things from the cars...."

"And how long have these bales of tobacco been here?"

"About 11 days. Fourteen cars arrived here, addressed to a local factory, but they absolutely cannot take away their own goods."

We met with the deputy director of the tobacco factory, V. Shuklin. He was completely at a loss.

"You must understand," he said, "our workshops are under repair, and, upon somebody's say-so, raw material keeps on arriving. What is to be done with it? I just cannot think of anything!"

The directors of the Dukat and Yava Factories in the capital also had headaches that day. More than 20 railroad cars, addressed to them, were standing at the Moscow-Butyrskaya Station. However, these enterprises also turned out to be under repair.

It is a typical situation, whereby ministries--in this case, the RSFSR Ministry of the Food Industry--draw up a poorly thought-out plan for hauling raw materials, then order and ship out by railroad that for which there is not yet any need. During our raid we also encountered instances of obvious mis-management. At the freight area in Kursk we were shown forge-press equipment which had arrived, addressed to one of the city's enterprises (Director A. Kormilitsin) as far back as...December of last year. For three months the car stood idle at the station until, without waiting for the persons in charge, the railroad workers themselves unloaded it. But why did such a delay occur?

"The consignees absolutely refused to accept this equipment," A. Shumakov, the deputy station chief, explained. "At first they declared that they did not need the equipment and that they had not ordered it. Then, after intervention by the city and oblast people's control committees, as well as that of the transport procurator's office, they began to assert that the machine tool was broken, and that its was precisely for that reason that they could not accept it...."

However, the Regulations of the USSR Railroads contain a paragraph which declares the following: "In the case of an item, the delivery of which has not been provided for by the plan (contract, order, or authorization), the freight consignee is obligated to accept the item from the station for responsible storage...." The managers know these lines. Nevertheless, here it is half a year now that inter-departmental explanations have been drawn out in Kursk. And at the station's freightyard forge-press equipment valued at more than 50,000 rubles has continued to rust and spoil. As it turned out, it had been manufactured at the order of one enterprise but sent to a different one.

And so it took more than half a year to discover this mistake. Was this entire story a randome instance? Of course not. It is the result of the viewpoint expressed in the saying "it is no business of mine," and under which a mistake permitted by the consigneee-ministry was not corrected in time by the local managers, and the state suffered economic losses.

Such cases, let's note, are not infrequent. An incorrectly indicated address of the consignee, as well as poorly thought-out planning for deliveries amount to and create the conditions for delaying freight items at terminal points. But sometimes it happens for other reasons: the documents are drawn up without mistakes, the assignment for hauling is well-founded, but the enterprise for which the raw material or equipment has arrived is, nevertheless, in no

hurry to haul it from the station. Why is this the case?

Warehouses on Wheels

On the day that we visited the Nerchinsk Station (in Chita Oblast) more than 420 containers had piled up here. The total volume of "frozen" items amounted to a thousand tons. A large part of the freight had arrived, addressed to the union of consumer cooperatives. We asked the deputy director, L. Brilliantova, the following question:

"Why don't you take the containers away?"

"There is no place to store them; we don't have enough special areas."

This was said in such a tone as if the lack of warehouses completely justified the situation. By the way, L. Brilliantova was not the only manager who hid his or her managerial sluggishness behind this reply. The following also complained about the lack of sufficient vacant areas for storing arriving items: the chief of the construction superintendent's section of Amursel'stroy, M. Voronin, the director of the Blagoveshchensk Liquor and Vodka Plant, V. Otrepkin, the director of the Kursk Confectionary Combine, A. Matyushanskiy, and the manager of the Zavitinsk Rayon Association of Sel'khozkhimiya in Amur Oblast, V. Budnik.... But to what extent are these replies justifiable? Are not managers obligated to build their own storage warehouses on the area of their enterprises? Of course, this is troublesome and requires certain expenditures of time and effort, but, on the other hand, it avoids, once and for all, the endless fines.

"But where did you get the idea that fines alarm me?" This question was asked with sincere surprise by G. Dutov, the deputy manager of the Kalganskiy Regional Association of Sel'khoztekhnika in Chita Oblast. "I pay them accurately, and I don't complain...."

This viewpoint, it must be said, is a frank one. These days it really is easier for managers to pay fines to the transport organization than to build their own storage facilities. They do not suffer at all from this economically. As the specialists explained it to us, the scope of the financial sanctions, have practically no effect on the well-being of the groups, and profits are only very slightly, intangiably reduced.

"What is the total amount that you have paid out this year for containers not being hauled away?" we asked the deputy chairperson of the Chita Oblast Consumer Cooperative Union, whom we had already become acquainted with.

"About 30,000 rubles," she replied.

To some persons this amount may not seem so great; nevertheless, for this money one could build an average warehouse. Even so, none of the managers with whom we had occasion to talk were in any hurry to build them. And so freight items are stored for months at the railroad stations. This testifies to the fact that the presently existing system of financial relations between the transport organizations and the freight consignees is imperfect and that it needs to be

An ever-increasing number of specialists are coming around to the idea that the penalties being imposed by the railroad people should become a component part of the production costs of the items being turned out by the enterprises. In that case, the influence of the financial sanctions on the economic position of the groups would be more tangible, for a penalty would directly influence the formation of the economic-incentives funds. It is thought that such a dependence would arouse the enterprise managers to create rear-line facilities with greater energy, to build warehouses and acquire auxiliary freight-handling equipment.

This, however, does not end the list of problems arising at the juncture-point between transport and production. Because, of course, in order to haul freight away from stations on time, a pool of trucks is needed. But not all enterprises have these at their disposal. One has to turn for help to the general-purpose motor-transport management. But just how effective is their aid?

The Caprices of Motor-Transport Management

The chief of freight service of the Transbaykal Railroad told us the following:

"The motor-transport people have a very peculiar attitude toward our concerns. For the current year, for example, we proposed they they sign an agreement to haul away 900,000 tons of freight from the Chita and Kadala Stations. However, the managers of the local motor-transport enterprise reduced our requisition by 100,000 tons. Why did they do that? Well, because a lowered plan is easier to fulfill, and that is what, in fact, did happen: the motor-transport management completed its half-year assignments by 102 percent. Furthermore, it engaged to provide service to an additional 33 urban enterprises. That means that they did have reserves."

Yes, these closely allied workers do have reserves. Nevertheless, they are in no hurry to bind themselves by tight obligations. They are undisturbed to receive reports that thousands of tons of freight are jamming up the stations for lengthy periods of time. Just what is it which impells them to act in ways detrimental to the national-economic interests? The fact is that not all items coming into the terminal points are profitable for hauling. For example, within the total volume of those 900,000 tons of freight presented by Chita's railroad workers to their partners in motor transport, there are heavy-weight products and light-weight ones. If there are cast-iron bars in the railroad cars, the drivers are confident that the plan will be fulfilled. But if there is cotton batting or glassware, they are not confident. Hence, their fussiness in selecting items to haul. But, inasmuch as at the beginning of the year nobody knows in what ratio profitable and unprofitable goods will arrive, the motor-transport people ensure themselves ahead of time; they agree to a contract where the plan has been lowered.

We visited the freight area of the Chita-1 Station and discovered furniture there which had come in on 24 May, addressed to City Store No. 5. The second month had gone by since the day when this scarce item had been delivered, but it had still not reached the customer. The tearful entreaties of the store director were curtly answered as follows by the motor-transport people: "We have no trucks." But here is what is curious: a heavy-weight freight which

arrived on 26 May for the Chita Scientific-Research Institute of Natural Resources was hauled out on the very same day. As we can see, trucks were found right away for a profitable client.

Such choosiness on the part of the motor-transport people eventually results in losses for the national economy. At the Shchigry Station in Kursk Oblast we were shown logs which were rotting after rains. The Leninets and Kirov Kolkhozes, for whom this freight had arrived, are in extreme need of lumber but cannot haul it out. They lack their own transport, and the motor-transport enterprises have refused to help. To be sure, the first secretary of the Shchigry Party Raykom, V. Burgin, assured us that the logs would soon be delivered to their destination. That's fine, of course, but what would have happened if our meeting had not taken place? Here, for example, we would not have managed to have a talk with the managers of the Zavitinskiy Rayon, Amur Oblast, and that day at the Zavitinsk Station-- since 2 June--more than 20,000 tons of mineral fertilizers had been lying there.

Of course, we assume that after this newspaper is published, and after the intervention of the local organs of authority, things will be set straight. But would it not have been better not to have the disorder in the first place, to have had the motor-transport haul out the freight which had arrived, addressed to the enterprises, construction projects, and kolkhozes, without any delays? What is necessary for this? Transportation specialists argue that the best solution to this problem could be the transfer of the motor-vehicle dispatching service from the system under the RSFSR Ministry of Motor Transport to the jurisdiction of the Ministry of Railways. All the more so in that until recently it was precisely such a structure which did exist. In connection with this, we would like to cite the opinion of authoritative scientists from the Institute on Comprehensive Transport Problems under USSR Gosplan, S. Ushakov and M. Sitnik. In their monograph, entitled "Theoretical Foundations of the USSR's Container Transport System," they have reached the following conclusion in particular: "The railroad variant of a dispatch office is almost twice as effective as a motor-vehicle one."

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